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MÁRCIO RODRIGUES COSTA

FATORES ASSOCIADOS À DISFUNÇÃO ERÉTIL EM PACIENTES PORTADORES DE DOENÇA RENAL CRÔNICA EM TRATAMENTO CONSERVADOR

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Tese de Doutorado apresentada ao Programa de Pós-Graduação em Ciências da Saúde da Universidade Federal de Goiás para obtenção do Título de Doutor em Ciências da Saúde.

Orientador: **Dr. Enio Chaves de Oliveira**
Co-orientadora: **Dra. Viviane Campos Ponciano**

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Ata **da Defesa de Tese de Doutorado** realizada por **Márcio Rodrigues Costa**. Aos **vinte dias do mês de setembro do ano de 2016**, às 14:00 horas, reuniu-se no **Hospital das Clínicas/UFG** a Comissão Julgadora infra nomeada para proceder ao julgamento da defesa de Tese intitulada: **"FATORES ASSOCIADOS À DESFUNÇÃO ERÉTIL EM PACIENTES PORTADORES DE INSUFICIÊNCIA RENAL CRÔNICA EM TRATAMENTO CONSERVADOR"**, como parte de requisitos necessários à obtenção do **título de Doutor**, área de concentração **Dinâmica do Processo Saúde-Doença.** O Presidente da Comissão julgadora, **Prof. Dr. Enio Chaves de Oliveira**, iniciando os trabalhos concedeu a palavra ao candidato, para exposição em até **50** minutos do seu trabalho. A seguir, o senhor presidente concedeu a palavra, pela ordem sucessivamente, aos Examinadores, os quais passaram a argüir ao candidato durante o prazo máximo de 30 minutos, assegurando-se o mesmo igual prazo para responder aos Senhores Examinadores. Ultimada a argüição que se desenvolveu nos termos regimentais, a Comissão, em sessão secreta, expressou seu Julgamento, considerando o candidato aprovado ou reprovado.

Banca Examinadora	**Aprovado(a)/Reprovado(a)**
Prof. Dr. Enio Chaves de Oliveira - Presidente	APROVADO
Prof. Dr. Claudemiro Quireze Júnior – Membro	APROVADO
Prof. Dr. Júlio Resplande de Araujo Filho – Membro	Aprovado
Prof. Dr. Félix André Sanches Penhavel – Membro	Aprovado
Prof. Dr. Renato Miranda de Melo – Membro	APROVADO
Prof. Dr. Mauri Félix de Sousa – Suplente	APROVADO
Profª. Drª. Edna Regina Silva Pereira - Suplente	

Em face do resultado obtido, a Comissão Julgadora considerou o candidato **Márcio Rodrigues Costa** Habilitado (X) Não habilitado ( ). Nada mais havendo a tratar, eu **Prof. Dr. Enio Chaves de Oliveira,** lavrei a presente ata que, após lida e achada conforme foi por todos assinada.

	Assinatura
Prof. Dr. Enio Chaves de Oliveira - Presidente	
Prof. Dr. Claudemiro Quireze Júnior – Membro	
Prof. Dr. Júlio Resplande de Araujo Filho – Membro	
Prof. Dr. Félix André Sanches Penhavel – Membro	
Prof. Dr. Renato Miranda de Melo – Membro	
Prof. Dr. Mauri Félix de Sousa – Suplente	
Profª. Drª. Edna Regina Silva Pereira - Suplente	

A banca examinadora aprovou a seguinte alteração no título da Tese:
Fatores Correlacionados à Disfunção Erétil em Pacientes Portadores de Doença Renal Crônica em Tratamento Conservador

Márcio Rodrigues Costa
Márcio Rodrigues Costa

Programa de Pós-Graduação em Ciências da Saúde
da Universidade Federal de Goiás

BANCA EXAMINADORA DA TESE DE DOUTORADO

Aluno: Márcio Rodrigues Costa

Orientador: Dr. Enio Chaves de Oliveira

Co-orientadora: Dra. Viviane Campos Ponciano

Membros:

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4. DR. CLAUDEMIRO QUIREZE JUNIOR
5. DR. FÉLIX ANDRÉ SANCHES PENHAVEL

OU

6. DR. MAURI FÉLIX DE SOUSA
7. DR. EDNA REGINA SILVA PEREIRA

Data: 20/09/2016

DEDICATÓRIA

Dedico este trabalho à minha querida esposa Ana Maria, a meus filhos Gustavo, Isabela e Helena, a meus pais Theobaldo e Maria do Rosário e a meus irmãos Théo e Carolina, por me apoiarem e estarem presentes em todos os bons e maus momentos de minha vida.

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Aos médicos Alexandre Magno Bahia Reis, Bruno Paiva Pereira, Arthur Magalhães de Oliveira e Caio Pereira Gomes, que foram colaboradores empenhados na atividade de coleta de dados;

Aos funcionários das instituições participantes do estudo, por prestarem serviços que ajudaram no desenvolvimento do projeto;

Por fim, agradeço às instituições Hospital das Clínicas da Universidade Federal de Goiás e Hospital Geral de Goiânia Doutor Alberto Rassi, por cederem suas dependências, sua infraestrutura e seus pacientes para realização do nosso trabalho.

SUMÁRIO

SIGLAS E ABREVIATURAS

BMI	*Body Mass Index*
BPH	*Benign Prostatic Hyperplasia*
CDS	*Collaborative Depression and Sexual Dysfunction*
CKD	*Chronic Kidney Disease*
CKDCT	*Chronic Kidney Disease on Conservative Treatment*
CT	*Conservative Treatment*
DE	Disfunção Erétil
DM	*Diabetes Mellitus*
DRC	Doença Renal Crônica
DRCTC	Doença Renal Crônica em Tratamento Conservador
DT	*Dialysis Treatment*
ED	*Erectile Dysfunction*
EF	*Erectile Function*
GFR	*Glomerular Filtration Rate*
HAS	Hipertensão Arterial Sistêmica
HD	*Hemodialysis*
HDL	*HighDensity Lipoprotein*
IIEF	*International Index of Erectile Dysfunction*
IMC	Índice de Massa Corpórea
KDOQI	*Kidney Disease Outcomes Quality Initiative*
LDL	*Low Density Lipid*
MLRA	*Multivariate Logistic Regression Analysis*
NOS	*Nitric Oxide Synthase*
SAH	*Systemic Arterial Hypertension*
SD	*Sexual Disorder*
SF	*Sexual Function*
TFG	Taxa de Filtração Glomerular
UFG	Universidade Federal de Goiás
ULRA	*Univariate Logistic Regression Analysis*

RESUMO

Objetivo: O objetivo deste estudo foi determinar a prevalência, gravidade e os fatores associados e influenciadores na função erétil de pacientes portadores de doença renal crônica em tratamento conservador. **Material e métodos:** Este estudo transversal desenvolveu-se entre maio de 2013 a dezembro de 2015. Participaram do estudo pacientes masculinos, voluntários, heterossexuais, com 18 anos de idade ou mais, portadores de doença renal crônica em tratamento conservador. Os pacientes tinham seguimento em ambulatórios específicos de doença renal crônica de dois hospitais em Goiânia. A disfunção erétil dos pacientes foi avaliada com as seis perguntas do domínio de função erétil (questões números 1 a 5 e 15) do *International Index of Erectile Dysfunction*. Enquanto as questões do IIEF eram aplicadas, os pesquisadores revisavam prontuários e preenchiam os formulários de pesquisa, que continham hábitos de vida, dados clínicos, laboratoriais e sociodemográficos. Os fatores associados à disfunção erétil nos portadores de doença renal crônica em tratamento conservador foram determinados por análise de regressão logística uni e multivariada. Compararam-se a prevalência e o grau de disfunção erétil entre pacientes com doença renal crônica em tratamento conservador em estágios III versus IV/V, com a aplicação do teste qui-quadrado. A correlação da taxa de filtração glomerular com o IIEF foi estimada pelo coeficiente de correlação de Pearson. **Resultados:** Dentre os 245 pacientes com doença renal crônica em tratamento conservador que participaram do estudo, 71,02% tinham disfunção erétil e, em 36,73%, o distúrbio sexual era grave. A análise individual das variáveis estudadas nestes pacientes, sem excluir a influência de uma sobre a outra, apontou associação de disfunção erétil com idade superior a 50 anos, índice de massa corpórea inferior a 25, *diabetes mellitus*, estágios IV/V de doença renal crônica, arritmias cardíacas e distúrbios de condução, hiperplasia prostática benigna, uso atual ou prévio de cigarro, uso de cigarro por 10 anos ou mais, índice maço-ano de cigarro maior ou igual a 20, tempo do uso de álcool igual ou superior a 10 anos, albumina inferior a 3,5 g/100 mL e níveis de depuração da creatinina entre 15 e 29 mL/min/1,73 m^2. A análise conjunta das variáveis estudadas nesse mesmo grupo de pacientes apontou associação independente de disfunção erétil com *diabetes mellitus* (P = 0,015). A comparação entre portadores de doença renal crônica em tratamento conservadores estágios III versus IV/V demonstrou maior prevalência de disfunção erétil nos graus mais avançados de doença renal crônica (P = 0,001) e frequência similar de disfunção erétil grave, moderada, moderada a leve e leve. A taxa de filtração glomerular demonstrou correlação positiva com a pontuação do IIEF. **Conclusões:** A prevalência de disfunção erétil em portadores de doença renal crônica em tratamento conservador é alta. Muitos fatores associam-se à disfunção erétil na população portadora de doença renal crônica em tratamento conservador. O único fator associado à disfunção erétil que não está sujeito à influência de outros agentes é a *diabetes mellitus*. A prevalência de disfunção erétil aumenta com a progressão da doença renal crônica em tratamento conservador.

Palavras-chave: insuficiência renal crônica, doença renal crônica, disfunção erétil, impotência, disfunção sexual e função erétil.

ABSTRACT

Objective: The objective of this study was to determine the prevalence, severity, factors associated and that influence erectile function in patients with chronic kidney disease on conservative treatment. **Methods:** This transversal study was developed between May 2013 and December 2015. Male volunteer patients, heterosexual, 18 years of age or older, carriers of chronic renal disease on conservative treatment participated of this study. The patients had follow up in the specific ambulatories of chronic renal disease in two hospitals of Goiânia. The erectile dysfunction of the patients was assessed using the six erectile function domain questions (questions numbers 1 to 5 and 15) of the International Index of Erectile Dysfunction. While the questions of the International Index of Erectile Dysfunction were applied, the researchers reviewed medical records and filled search forms containing lifestyle habits, clinical, laboratory and sociodemographic data. The factors associated with erectile dysfunction in patients with chronic renal disease in conservative treatment were determined by univariate and multivariate logistic regression analysis. The prevalence and degree of erectile dysfunction among patients with chronic renal disease in conservative treatment in stage III versus IV/V were compared with the application of chi-square test. The correlation between glomerular filtration rate and International Index of Erectile Dysfunction score was estimated by Pearson correlation coefficient. **Results:** Among 245 patients with chronic renal disease on conservative treatment in the study, 71.02% had erectile dysfunction and the sexual disorder was severe in 36.73%. Individual analysis of the variables in these patients, without excluding the influence of one over the other, pointed erectile dysfunction associated with the age more than 50 years, body mass index less than 25, diabetes mellitus, stage IV/V of chronic kidney disease, cardiac arrhythmias and conduction disorders, benign prostatic hyperplasia, present or prior cigarette use, cigarette use for 10 years or more, pack-year cigarette index greater or equal to 20, alcohol usage time equal to or greater than 10 years, albumin less than 3.5 g /100 mL and creatinine clearance levels between 15 and 29 mL/min/1.73 m^2. The conjunct analysis of the variables studied in this same group of patients has showed an independent association of erectile dysfunction with diabetes mellitus (P = 0.015). A comparison of patients with chronic renal disease on conservative treatment stage III versus IV/V has demonstrated a higher prevalence of erectile dysfunction in more advanced stages of chronic renal disease (P = 0.001) and similar frequency of severe, moderate, moderate to mild and mild erectile dysfunctions. Glomerular filtration rate has showed a positive correlation with the score of the International Index of Erectile Dysfunction. **Conclusions:** The prevalence of erectile dysfunction in patients with chronic renal disease in conservative treatment is high. Many factors are associated with erectile dysfunction in chronic renal disease population on conservative treatment. The only factor associated with erectile dysfunction that is not subject to influence from other agents is diabetes mellitus. The prevalence of erectile dysfunction increases with the progression of chronic renal disease on conservative treatment.

Keywords: chronic renal failure, chronic kidney disease, erectile dysfunction, impotence, sexual dysfunction and erectile function.

1 CARACTERIZAÇÃO DO PROBLEMA

1.1 Disfunção erétil: prevalência

Disfunção erétil (DE) é a condição definida como persistente incapacidade de atingir e/ou manter ereção suficiente para uma função sexual satisfatória, situação particularmente muito comum entre homens de todo o mundo (NATIONAL INSTITUTES OF HEALTH, 1993). Estudos epidemiológicos, realizados em várias localidades, corroboram essa ideia. O primeiro deles, o *Massachusetts Male Aging Study*, avaliou homens não institucionalizados, entre 40 e 70 anos, da cidade de Boston e imediações. A prevalência de DE encontrada foi de 52%. Os entrevistados foram categorizados conforme a gravidade da doença em portadores de DE mínima, moderada e completa e apresentaram prevalência do distúrbio de 17,2%, 25,2% e 9,6% respectivamente (FELDMAN; GOLDSTEIN; HATZICHRISTOU, 1994). Os trabalhos do *Cologne Male Survey* e do *National Health and Social Life Survey* detectaram respectivamente DE em 19,2% e 31% da população avaliada (LAUMANN; PAIK; ROSEN, 1999; BRAUN *et al.*, 2000). Pesquisas realizadas em Taiwan e Gana registraram DE em 27% e 59,6% dos entrevistados respectivamente (HWANG, 2010; AMIDU, 2010) (Quadro 1).

Quadro 1-Prevalência de disfunção erétil encontrada por diferentes autores.

Autor	Local	Ano	Prevalência
Feldman *et al*.	EUA	1994	52%
Laumann *et al*.	EUA	1999	31%
Braun *et al*.	Alemanha	2000	19,2%
Hwang	Taiwan	2010	27 %
Amidu	Gana	2010	59,6%

A diferença de prevalência de DE detectada nos estudos citados pode ser explicada em parte pela falta de uniformidade metodológica entre estes trabalhos, e por diferenças entre as populações estudadas, principalmente no que se refere à idade e ao *status* socioeconômico e cultural (HATZIMOURATIDIS *et al.*, 2014). De qualquer modo, apesar dessas limitações para interpretação dos estudos, fica evidente que a DE é

condição clínica muito comum e que deve ser considerada como problema de saúde pública.

1.2 Disfunção erétil: causas

As causas de DE são bem diversificadas, destacando-se: as vasculares (doenças cardiovasculares, hipertensão arterial sistêmica (HAS), *diabetes mellitus* (DM), dislipidemia, tabagismo, cirurgias pélvicas, radioterapia pélvica ou de retroperitônio); as neurogênicas centrais (esclerose múltipla, doença de Parkinson, atrofia muscular múltipla, trauma da medula espinhal, acidente vascular cerebral, tumores do sistema nervoso central); as neurogênicas periféricas (DM, doença renal crônica (DRC), polineuropatias, cirurgias pélvicas e de retroperitôneo); as anatômicas ou estruturais (hipospádia, epispádias, micropênis, curvatura congênita do pênis e doença de Peyronie); as hormonais (hipogonadismo, hiperprolactinemia, hiper e hipotireoidismo, hiper e hipocortisolismo); as induzidas por drogas (anti-hipertensivos, antidepressivos, antipsicóticos, antiandrógenos, análogos e antagonistas de hormônio liberador de gonadotrofina, drogas recreativas); as psicogênicas (relacionadas às parceiras, à espectativa de desempenho, à falta de intimidade sexual) e as causas traumáticas (fratura peniana) (HATZIMOURATIDIS *et al*., 2014).

As causas de DE são de amplo conhecimento no meio médico, porém, nos casos em que muitos fatores etiológicos estão presentes, é difícil estabelecer quais as condições que desencadearam o distúrbio. A HAS e a DE, além de apresentarem muitos mecanismos fisiopatológicos em comum, freqüentemente ocorrem em conjunto, e muitas vezes, o distúrbio sexual é decorrente da HAS (PAPATSORIS; KORANTZOPOULOS, 2006). Por outro lado, o tratamento padrão da HAS, os anti-hipertensivos, podem afetar negativamente a função erétil (PAPATSORIS; KORANTZOPOULOS, 2006). Desse modo, é provável que vários pacientes hipertensos portadores de DE em uso de anti-hipertensivos tenham a disfunção sexual causada pelo uso da droga e/ou pela HAS, e o fator etiológico não pode ser definido ao certo (PAPADOPOULOU *et al*., 2015).

1.3 Disfunção erétil: consequências

Embora tenha natureza benigna, a DE pode afetar a saúde física, mental e social dos homens. Assim, essa condição pode trazer significativo impacto negativo na qualidade de vida tanto dos seus portadores como de suas parceiras (FELDMAN; GOLDSTEIN; HATZICHRISTOU, 1994). Pesquisa com 2.476 homens espanhóis não

institucionalizados, com idade entre 25 e 70 anos, demonstrou clara associação negativa entre a DE e a qualidade de vida (SÁNCHEZ-CRUZ *et al*.; 2003). O'Connor *et al*. (2012) entrevistaram 100 parceiras de portadores de DE e detecteram número significativo de mulheres com descontentamento e frustração em relação à sua vida sexual.

A DE, além de afetar a qualidade de vida e prejudicar a vida sexual dos casais, desencadeia ansiedade e tensão, diminui a autoestima e representa fator de risco para depressão, uma das comorbidades mais comumente descritas entre esses homens (BELLINGHIERI *et al*., 2008; PERELMAN, 2011). Durante o primeiro ano de seguimento de estudo longitudinal de cinco anos, *Chou et al*. (2015) observaram risco cerca de duas vezes maior e incidência cerca de três vezes maior de depressão em 2.527 portadores de DE, quando comparados com o grupo controle.

As circunstâncias descritas sugerem que muitos problemas são provenientes da DE, portanto, valorizar e tratar essa condição clínica é importante para limitar os danos e prejuízos causados por ela (Figura 1).

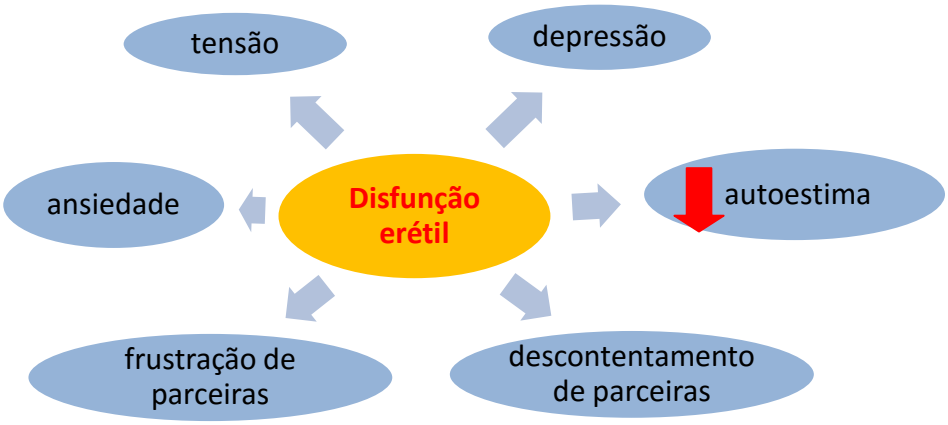

Figura 1- Consequências da disfunção erétil.Sánchez-Cruz *et al*. (2003); Bellinghieri*et al*. (2008); Perelman (2011); Chou *et al*. (2015).

1.4 Instrumento de medida de disfunção erétil (*International Index of Erectile Dysfunction* – IIEF)

O IIEF é uma ferramenta desenvolvida com o objetivo de mensurar a função erétil por meio de um questionário simples, auto-aplicável, breve e confiável (ROSEN, 1997). O instrumento apresenta alto grau de reprodutibilidade, sensibilidade e especificidade (ROSEN, 1997). Além de ser considerado o "padrão-ouro" para avaliação de distúrbios sexuais, provavelmente é o instrumento de medida de disfunção erétil mais usado em pesquisas científicas em todo o mundo (ROSEN, 1997; ROSEN; CAPPELLERI;

GENDRANO; 2002). O questionário original, validado psicometricamente em várias línguas (inclusive em português), é composto por 15 perguntas referentes a cinco domínios da esfera sexual (função erétil, orgasmo, desejo sexual, satisfação na relação sexual e satisfação geral) (ROSEN, 1997; QUINTA; NOBRE, 2012). O domínio de função erétil tem seis questões com alternativas que correspondem a diferentes pontuações. A somatória dessas pontuações permite classificar os pacientes em cinco graus de DE (Quadro 2).

Quadro 2-Interpretação da pontuação do *International Indexof Erectile Dysfunction.*

IIEF* (DOMÍNIO DE FUNÇÃO ERÉTIL)	
Pontuação	**Interpretação**
25-30	Sem DE
19-24	DE leve
13-18	DE leve a moderada
7-12	DE moderada
1-6	DE grave

**International Index of Erectile Dysfunction* (ROSEN, 1997).

Uma versão resumida de cinco itens do IIEF foi desenvolvida (IIEF-5) para diagnosticar a presença e gravidade da DE. As questões escolhidas eram direcionadas para a análise de função erétil e satisfação sexual e foram selecionadas com base na capacidade de identificar a presença ou ausência de DE (ROSEN *et al*., 1999). A versão resumida apresentou resultados semelhantes à original, no que se refere à sensibilidade e especificidade de diagnóstico de DE e, portanto, também é considerada uma ferramenta excelente para esse fim (ROSEN *et al*., 1999; ROSEN; CAPPELLERI: GENDRANO, 2002). Apesar disso, restrições são citadas para essa versão resumida. A aplicação limita-se a pacientes que têm relacionamentos estáveis e que tentaram atividade sexual com penetração, portanto, não pode ser estendida a toda população. Além disso, sua concepção se deu a partir de uma única amostra, de um único estudo clínico de homens com DE e, portanto, é questionável a forma como os termos usados nessa versão são vistos nas diferentes culturas e se os mesmos podem ser estendidos para a população em geral (ROSEN; CAPPELLERI; GENDRANO, 2002). Por fim, existem relatos que o IIEF-5 pode superestimar a prevalência de DE (NAVANEETHAN *et al*., 2010).

1.5 Doença renal crônica: classificação

Segundo o *Kidney Disease Outcomes Quality Initiative (KDOQI)* (2012), DRC é definida como anormalidades estruturais ou funcionais do rim, presentes por mais de 3 meses, com implicações para saúde. A doença renal crônica em tratamento conservador (DRCTC) implica que o paciente não recebe terapia de substituição renal (diálise ou transplante renal).

Os critérios para classificação da DRC estão expostos no Quadro 3. A TFG tem papel relevante não só na definição de DRC como também na classificação da doença, que tem por objetivo facilitar a comunicação entre os profissionais de saúde, padronizar a terminologia médica, e evitar a ambigüidade e a sobreposição de termos (BASTOS; KIRSZTAJN, 2011).

Quadro 3-Estadiamento da doença renal crônica.

Estágios da doença renal crônica	Taxa de filtração glomerular*	Proteinúria
1	≥90	Presente
2	89-60	Presente
3A	59-45	
3B	44-30	
4	29-15	
5	< 15	

*mL/min/1,73 m^2, *Kidney Disease Outcomes Quality Initiative*, 2012.

1.6 Doença renal crônica: dados epidemiológicos

Os dados epidemiológicos de DRC sugerem que a doença deve ser tratada como uma das mais importantes epidemias deste milênio (BASTOS; KIRSZTAJN, 2011). O inquérito epidemiológico, *National Health and Nutrition Examination Survey*, aplicado sob supervisão do *National Center for Health Statistics*, avalia a cada dois anos amostras transversais de pessoas com vinte anos ou mais, as quais representam residentes civis não institucionalizadas dos EUA. De acordo com essas instituições, a prevalência de DRC na população norte-americana, em estágios não dialíticos, é aproximadamente de 15% (Figura 2) (*CENTERS FOR DISEASE CONTROL AND PREVENTION*, 2016).

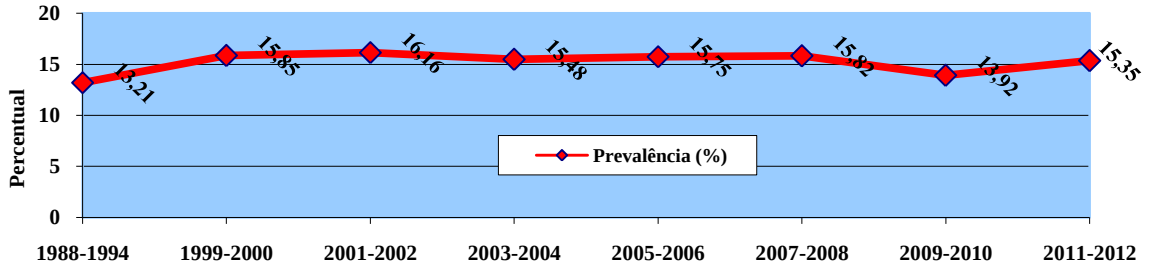

Figura 2- Prevalência de doença renal crônica de 1988 a 2012, estágios 1 a 4. *National Health and Nutrition Examination survey*. *Centers for Disease Control and Prevention*. *Chronic Kidney Disease Surveillance System-United States*. Website: http://www.cdc.gov/ckd.

A pequena variação na prevalência de DRC (estágios 1 a 4) no decorrer dos anos não significou estagnação dessa população em números absolutos (Figura 2). No ano de 2000, os habitantes dos EUA somavam 281,4 milhões de pessoas e, em 2011, essa população aumentou para 308,7 milhões (*U.S. CENSUS BUREAU*, 2016). Considerando as prevalências de DRC em estágios de 1 a 4, nesse mesmo período, o número de portadores da doença cresceu de 44,6 para 47,3 milhões (Figura 2). De forma absoluta, houve um aumento de pouco mais de 6% nessa população.

A incidência de DRC em norte-americanos foi estimada a partir de dados do *Veterans Affairs Health System* (Figura 3). Cerca de 70% dos veteranos de guerra e seus dependentes, em acompanhamento ambulatorial, submeteram-se em algum momento à dosagem de creatinina sérica. De acordo com esse sistema de saúde, a incidência de DRC nos estágios 3, 4 e 5, entre os anos de 2006 e 2012, foi estável nos usuários avaliados, exceto por um pico isolado, no ano de 2007, de modo mais pronunciado no estágio 3 (*CENTERS FOR DISEASE CONTROL AND PREVENTION*, 2016).

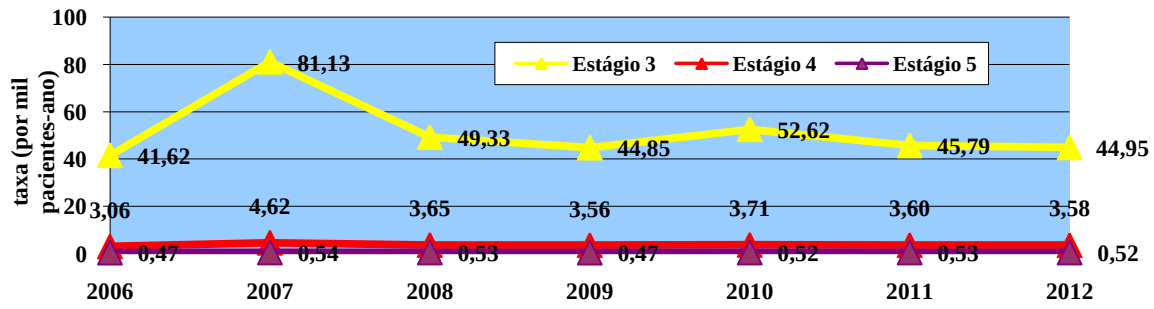

Figura 3- Incidência de doença renal crônica, estágios 3, 4 e 5, entre anos de 2006 a 2012. *Veterans Affairs Health System*. *Centers for Disease Control and Prevention*. *Chronic Kidney Disease Surveillance System-United States*. Website: http://www.cdc.gov/ckd.

Embora os dados demográficos dos usuários do *Veterans Affairs Health System* sejam distintos da população geral, eles permitem uma visão, ainda que superficial, de

alguns aspectos da saúde pública norte-americana (*CENTERS FOR DISEASE CONTROL AND PREVENTION*, 2016). Da mesma forma que a prevalência, a estabilidade da incidência de DRC desse sistema de saúde, se extrapolada para toda a população norte-americana, representa em números absolutos um aumento de novos casos, uma vez que a população dos EUA está em crescimento (U.S. *CENSUS BUREAU*, 2016).

No Brasil, os dados epidemiológicos dos pacientes em diálise foram coletados por meio de censos organizados pela Sociedade Brasileira de Nefrologia. No ano de 2000, os pacientes em diálise eram pouco mais de 42,6 mil e, em 2013, aumentaram para mais de 100,3 mil, o que representou um crescimento de mais de 135% da população neste período (SOCIEDADE BRASILEIRA DE NEFROLOGIA, 2013) (Figura 4).

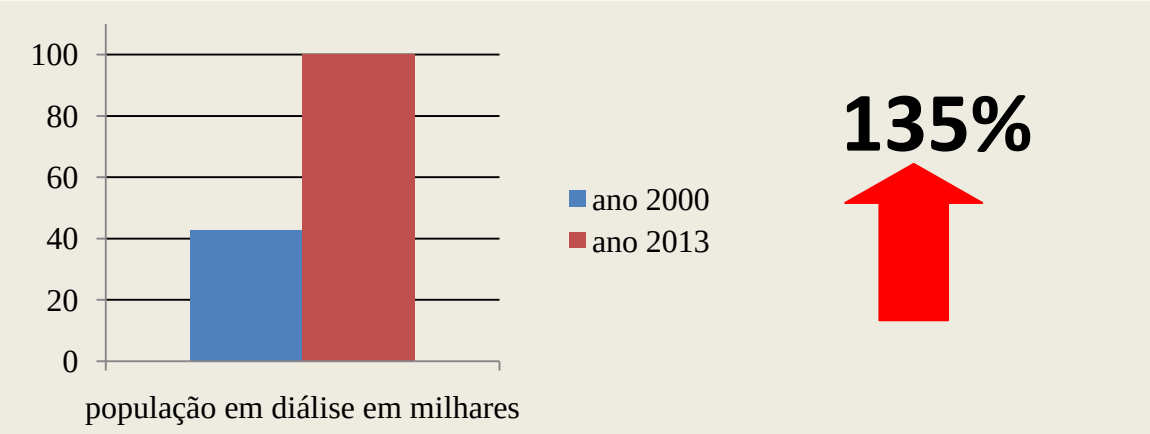

Figura 4- Crescimento da população em hemodiálise no Brasil. Sociedade Brasileira de Nefrologia (2013).

Os dados epidemiológicos dos portadores de DRCTC no Brasil não foram coletados por censos. As informações sobre o assunto são imprecisas e superficiais e foram verificadas em pesquisas regionais que não direcionaram a avaliação, unicamente, para essa população. Estudo realizado em Ibitinga-MG, com 1494 pessoas de 60 anos ou mais, detectou em 5,09% deles alteração dos níveis de creatinina (PASSOS; BARRETO; LIMA-COSTA; *BAMBUÍ HEALTH AND AGEING STUDY GROUP*, 2003). Fernandes, Bastos e Bastos (2010) analisaram amostra de adultos brasileiros em diferentes faixas etárias e encontraram TFG < 45 mL/min/1,73 m^2 em 2,3% da população. Se considerarmos essa amostra como representativa da nossa população (atualmente em torno de 205 milhões de pessoas), estima-se que existam cerca de 4,7 milhões de portadoras de DRC estágios 3B, 4 ou 5 (FERNANDES; BASTOS; BASTOS, 2010; INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2016) (Figura 5).

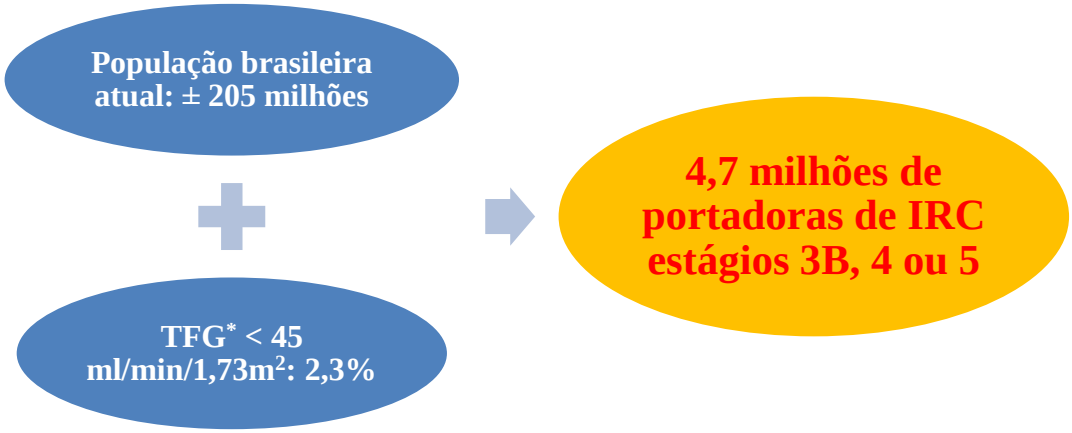

Figura5- Estimativa da prevalência de portadores de doença renal crônica no Brasil. *Taxa de filtração glomerular. (FERNANDES, BASTOS E BASTOS, 2010; INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2016).

Os dados norte-americanos e nacionais apresentados, apesar das restrições para interpretação, são suficientes para afirmar que a DRC é um problema de grandes dimensões e, dessa forma, merece atenção e cuidado especial não só pelos médicos como também pelas autoridades de saúde.

1.7 Disfunção erétil em portadores de doença renal crônica

1.7.1 Comorbidades, medicações e fatores sociodemográficos associados

Envelhecimento, tabagismo e dislipidemia são fatores associados à DE frequentemente relatados na população em geral. Entre os pacientes com doença renal em estágio final, que realizam hemodiálise, Messina *et al*. (2007) observaram maior prevalência de DE naqueles com mais de 50 anos. De forma semelhante, Cerqueira, Moraes e Glina (2002), ao avaliarem 119 homens em tratamento dialítico, constataram associação da DE com envelhecimento e adicionalmente com o hábito de fumar e dislipidemia. Já o estudo de Rosas *et al*. (2001) sobre 302 pacientes portadores de DRC em estágio final não correlacionou tabagismo e alteração da função erétil. Do mesmo modo, o *Collaborative Depression and Sexual dysfunction in Hemodialysis Working Group* (2011), ao analisar níveis de LDL-colesterol em população semelhante, não observou correlação de DE nos pacientes com dislipidemia.

Assim como a dislipidemia e o tabagismo, o efeito da obesidade sobre a função erétil em portadores de DRC é controverso. Stolic e Bukumiric (2011), em pesquisa com 73 homens que realizavam hemodiálise cronicamente, encontraram maior índice de massa corpórea (IMC) nos pacientes com DE. Entretanto, de modo contrário,

Malekemakan *et al*. (2011) evidenciaram, nessa população, associação entre obesidade e melhora da função erétil.

Da mesma forma que o IMC, a influência da HAS no desempenho sexual dos portadores de DRC não tem padrão bem definido. Vários estudos apontam alta prevalência de alterações pressóricas arteriais nessa população, porém, sem demonstrar associação com o agravamento da DE (PALMER, 1999; MESQUITA *et al*., 2012; CERQUEIRA; MOREAS; GLINA, 2002; NETO *et al*., 2002).

O papel das medicações sobre o desempenho sexual entre portadores de DRC também não é bem esclarecido. Vários anti-hipertensivos antigos, como bloqueadores adrenérgicos centrais, diuréticos, espironolactona e betabloqueadores, especialmente os não seletivos, são frequentemente utilizados por portadores de DRC e citados como potencialmente prejudiciais à função sexual (PAPADOPOULOU *et al*., 2015). Apesar disso, Rosas *et al*. (2001) e Seck *et al*. (2011) não encontraram associação de DE e uso de betabloqueadores ou diuréticos em pacientes dialíticos. Outras drogas amplamente utilizadas por portadores de DRC também são tradicionalmente associadas com alterações da função erétil, tais como antidepressivos, antagonistas de H2 e benzodiazepinas (DERBY *et al*., 2001). Entretanto, o efeito prejudical desses medicamentos não foi encontrado regularmente nessa população (ROSAS *et al*., 2001; NETO *et al*., 2002).

A coronariopatia é uma das comorbidades mais frequentemente citadas como comprometedoras do desempenho sexual. Na população em geral, tem sido relatado que a DE está relacionada com a doença coronáriana silenciosa, e assim, os pacientes com sintomas de disfunção sexual tendem a ter mais calcificação arterial em coronárias, mesmo com a ausência de sintomas de angina (CHIURLIA, 2005; JACKSON; PADLEY, 2008). Esse achado é comumente observado entre pacientes dialíticos com DE grave, que da mesma forma, tendem a apresentar mais calcificação coronariana (INCI *et al*., 2008). Eventos cardiovasculares prévios e cardiopatias também se correlacionam frequentemente com disfunção sexual em homens portadores de DRC, porém não em todos os estudos (NAYA *et al*., 2002; NETO *et al*., 2002; STOLIC; BUKUMIRIC, 2010; *COLLABORATIVE DEPRESSION AND SEXUAL DYSFUNCTION IN HEMODIALYSIS WORKING GROUP*, 2012).

Por fim, um aspecto interessante é verificado com a DM que, de modo diferente da maior parte das comorbidades citadas anteriormente, é considerada fator de risco

independente para DE na grande maioria dos estudos que avaliaram pacientes com DRC (NAYA *et al*., 2002; NETO *et al*., 2002; MESSINA *et al*., 2007).

Diante das evidências, observa-se que, de modo geral, não existe consenso do papel de fatores sociodemográficos e comorbidades sobre a função erétil de portadores de DRC (Figura 6).

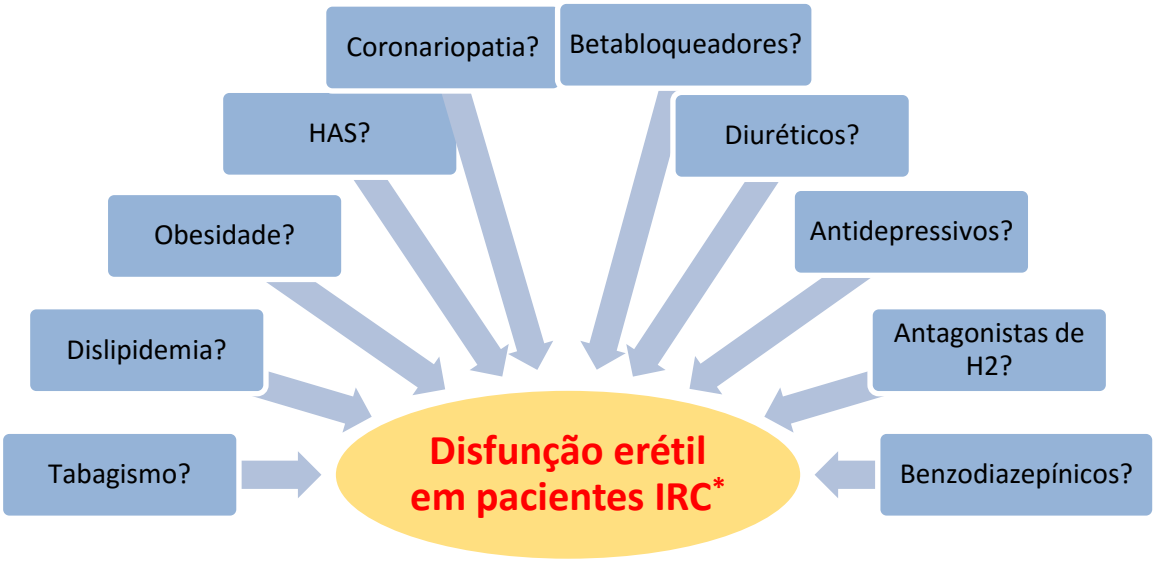

Figura 6- Fatores associadas inconsistentemente à disfunção erétil em pacientes portadores de doença renal crônica. *Doença renal crônica (MESSINA *et al*. 2007; MALEKEMAKAN *et al*. 2011; PALMER, 1999; CERQUEIRA, MOREAS E GLINA, 2002; PAPADOPOULOU *et al*. 2015; SECK *et al*. 2011; DERBY *et al*. 2001; ROSAS *et al*. 2001; JACKSON *et al*. 2008; CHIURLIA, 2005; INCI *et al*. 2008; STOLIC *et al*. 2010; *COLLABORATIVE DEPRESSION AND SEXUAL DYSFUNCTION IN HEMODIALYSIS WORKING GROUP*, 2012; NAYA *et al*. 2002; NETO *et al*. 2002; BELLINGHIERI *et al*. 2008; LUTFI *et al*. 2015; CHUANG *et al*. 2012; MESQUITA *et al*. 2012; ESEN *et al*. 2015; HERMANS *et al*. 2009**;** LEVY, 1973; ABOBAKR *et al*. 2011; FRYCKSTEDT E HYLANDER, 2008; ABRAM *et al*. 1975; BREZA *et al*. 1993).

1.8 Disfunção erétil em portadores de doença renal crônica em tratamento conservador

1.8.1 Prevalência

A prevalência de DE em portadores de DRCTC é muito variável. A primeira referência desse tipo de avaliação nessa população ocorreu com Levy (1973), que estimou distúrbio sexual em 9% dos pacientes pré-dialíticos de ambos os sexos. Na avaliação de 25 pacientes masculinos urêmicos, em tratamento conservador, Procci *et al*. (1981) encontraram 40% de pacientes com DE. Breza *et al*. (1993), em pesquisa que analisou 53 homens portadores de DRC, relataram desordens de ereção em 41,5% desses pacientes antes de iniciar tratamento com hemodiálise. Bellinghieri, Savica e Santoro (2006) referiram que a DE ocorre em aproximadamente 30% dos pacientes urêmicos em tratamento conservador. Mesquita *et al*. (2012) avaliaram 81 pacientes ambulatoriais

portadores de DRC em estágios 3,4 e 5, tratados conservadoramente e, em 76,5% desses homens identificou-se DE, sendo que em 29,6% o distúrbio era leve, em 18,5%, leve/moderado, em 16%, moderado, e em 12,3%, grave. Esen *et al*. (2015) estudaram 26 homens com TFG estimada entre 15 e 90 mL/min/1,73 m^2, sendo que a frequência de DE nesses pacientes foi de 84%.

De acordo com os dados apresentados, a prevalência de DE em pacientes portadores de DRCTC varia de 9 a 84% (LEVY, 1973; BREZA *et al*., 1993; BELLINGHIERI; SAVICA; SANTORO, 2006; DE ABOBAKR *et al*., 2011; MESQUITA *et al*., 2012; ESEN *et al*., 2015) (Quadro 4).

Quadro 4- Prevalência de disfunção erétil em portadores de doença renal crônica em tratamento conservador.

Autor	Ano	Prevalência
Levy	1973	9%
Procci *et al*.	1981	40%
Breza *et al*.	1993	41,5%
Bellinghieri *et al*.	2006	30 %
Mesquita *et al*.	2012	76,5%
Esen *et al*.	2015	84%

A amplitude de frequência entre os trabalhos é reflexo da falta de uniformidade metodológica. Em alguns casos, as pesquisas tiveram número inexpressivo de pacientes e, em outros, os pacientes avaliados eram representativos apenas da população de um determinado serviço (MESQUITA *et al*., 2012; ESEN *et al*., 2015). Nenhum estudo randomizou as amostras e houve situações em que pacientes masculinos foram avaliados conjuntamente com os femininos (LEVY, 1973; BREZA *et al*., 1993; BELLINGHIERI; SAVICA; SANTORO, 2006; DE ABOBAKR *et al*. 2011; MESQUITA *et al*., 2012; ESEN *et al*., 2015). Os pacientes desses trabalhos não eram comparáveis em características que poderiam influenciar na DE, como por exemplo a idade e o grau de DRC (MESQUITA *et al*., 2012; ESEN *et al*., 2015). As pesquisas não usaram a mesma definição de DE e nem as mesmas ferramentas para avaliação de disfunção sexual. Alguns instrumentos foram desenvolvidos especificamente para um único estudo e muitos não eram validados psicometricamente nas línguas dos países nos quais foram

aplicados (LEVY, 1973; BREZA *et al*., 1993; BELLINGHIERI; SAVICA; SANTORO, 2006; DE ABOBAKR *et al*. 2011; MESQUITA *et al*., 2012; ESEN *et al*., 2015).

Diante disso, novas pesquisas que avaliem a prevalência de DE em pacientes com DRCTC devem ser desenvolvidas com especial atenção aos fatores confundidores que dificultam a interpretação dos resultados.

1.8.2 Influência da taxa de filtração glomerular e estágio de doença renal crônica

Um dos primeiros artigos publicados sobre o assunto relatou que, entre 287 homens em hemodiálise, 137 (48%) referiram piora ou aparente piora das funções sexuais com a progressão da uremia, antes de se iniciar a hemodiálise (LEVY, 1973). No estudo de Abram *et al*. (1975), 45% dos 32 pacientes masculinos casados em tratamento dialítico relataram redução da potência sexual após o início da doença renal. Bellinghieri *et al*. (2008) selecionaram pacientes com DRC em estágios 3 e 4 que faziam acompanhamento no ambulatório de nefrologia. Resultados preliminares mostraram correlação inversa entre o IIEF e a TFG. Lutfi *et al*. (2015) estudaram 183 pacientes submetidos à angiografia por infarto agudo do miocárdio e, destes, 100 apresentavam DE; a avaliação do número de coronárias doentes e da função renal correlacionou DE com menores TFG em pacientes com doença coronariana uniarterial. De modo semelhante, Chuang *et al*. (2012) relataram DE associada tanto à albuminúria quanto à menor TFG em pacientes portadores de DM tipo 2.

Em meio a evidências de associação de DE com menores taxas de filtração glomerular, alguns estudos não estabeleceram essa correlação. Mesquita *et al*. (2012) encontraram DE em 72,3%, 81,5% e 85,7% dos 81 pacientes ambulatoriais portadores de DRC em estágios 3, 4, e 5, respectivamente. Esses grupos, representantes de diferentes TFG, não apresentaram diferença estatística na prevalência de DE. Esen *et al*. (2015) seguiram pacientes masculinos com TFG estimada entre 15 e 90 mL/min/1,73 m^2 (26 pacientes) e compararam com controles pareados por idade (20 pacientes com TFG estimada de 90 mL/min/1,73 m^2 ou mais). As taxas de DE encontradas foram de 84% (pacientes) e 75% (controles), o que não representou diferença estatística. Situação similar foi observada no estudo transversal de Hermans *et al*. (2009), em diabéticos tipo 2, que detectou relação entre DE e microangiopatia e retinopatia diabética, mas não com os níveis de filtração glomerular.

Assim, de acordo com o apresentado, a TFG tem efeito inconclusivo sobre a função sexual dos pacientes portadores de DRC, e o assunto é ainda controverso na literatura médica.

1.8.3 Influência de outros fatores

Poucas pesquisas avaliaram a correlação de fatores clínicos e sociodemográficos com alterações sexuais em portadores de DRCTC. Mesquita *et al*. (2012), na avaliação de 81 pacientes masculinos com DRCTC, encontraram associação de DE com a DM e o tempo de diagnóstico desta comorbidade. Bellinghieri *et al*. (2008) conduziram estudo com homens em estágios 3 e 4 de DRC e compararam com controles sem doenças renais; a pesquisa demonstrou correlação inversa entre níveis de testosterona com o IIEF. Outros estudos a respeito do tema em população semelhante foram buscados nos bancos de dados do *Pubmed* e do Portal Capes, usando o cruzamento dos descritores e *MeSH (Medical Subject Headings) terms chronic renal insufficiency, chronic kidney disease, end stage kidney disease, erectile function, erectile dysfunction, impotence, sexual disturb, sexual disorder, sexual dysfunction e sexual function*. A busca localizou apenas um estudo que priorizou estudar os fatores associados à DE em portadores de DRCTC (MESQUITA *et al*., 2012). Assim, o pequeno número de trabalhos referentes a esse assunto denota o pouco conhecimento e a necessidade de mais pesquisas que abordem o tema.

Figura 7- Busca em banco de dados de estudos referente a fatores associados à disfunção erétil em portadores de doença renal crônica em tratamento conservador. *Disfunção erétil, **Doença renal crônica (MESQUITA *et al*. 2012; BELLINGHIERI *et al*., 2008).

2 JUSTIFICATIVA DO ESTUDO

Tanto a DE como a DRCTC são condições muito freqüentes na população geral. Diante disto, não devemos negligenciar suas conseqüências, uma vez que isso prejudicaria o bem-estar e a qualidade de vida dos pacientes afetados por essas doenças. È importante destacar que a DE está frequentemente associada à DRC, podendo inclusive ser uma conseqüência do distúrbio renal. Estudos que esclareçam melhor esta associação têm o potencial de alertar os médicos e os demais profissionais de saúde envolvidos nos cuidados a estes pacientes sobre a importância do diagnóstico e do tratamento destas condições. Adiciona-se a isto o fato de que os trabalhos de prevalência de DE nos pacientes portadores de DRCTC são escassos e apresentam resultados conflitantes, o que impossibilita conhecer a real dimensão do problema bem, como os fatores que realmente são associados à função erétil destes pacientes.

3 OBJETIVOS

3.1 Geral

- Identificar fatores associados à disfunção erétil em portadores de doença renal crônica em tratamento conservador.

3.2 Específicos

- Determinar a prevalência de disfunção erétil em portadores de doença renal crônica em tratamento conservador;
- Determinar o grau de disfunção erétil em portadores de doença renal crônica em tratamento conservador;
- Determinar a associação de hábitos de vida, aspectos sociodemográficos, dados clínicos e laboratoriais com a disfunção erétil em portadores de doença renal crônica em tratamento conservador;
- Determinar a influência do estágio de doença renal e da taxa de filtração glomerular na gravidade e prevalência de disfunção erétil em portadores de doença renal crônica em tratamento conservador.

4 MÉTODO(S)

4.1 Desenho do estudo e aspectos éticos

Este é um estudo observacional transversal, realizado no período de maio de 2013 a dezembro de 2015. O comitê de ética do Hospital das Clínicas da Universidade Federal de Goiás (UFG) aprovou o protocolo do estudo (documento nº090/2011, Anexo 1).

4.2 Local do estudo

Os dados foram coletados em dois hospitais públicos terciários na cidade de Goiânia, que realizam atendimento de pacientes do Sistema Único de Saúde (Hospital das Clínicas da UFG e Hospital Geral de Goiânia Doutor Alberto Rassi).

4.3 População e amostragem

A população-alvo do estudo era composta por pacientes masculinos portadores de doença renal crônica em tratamento conservador. Para compor a amostra, abordaram-se pacientes masculinos com atendimento agendado nos ambulatórios específicos de DRC dos serviços de nefrologia das unidades de saúde do estudo. Esses atendimentos ocorriam no período vespertino, sistematicamente, às segundas-feiras no Hospital Geral de Goiânia Doutor Alberto Rassi e às terças-feiras no Hospital das Clínicas da UFG. As datas em que ocorreu a abordagem aos pacientes foram escolhidas dentro do período do estudo, de acordo com a conveniência para os pesquisadores. Todos os pacientes masculinos presentes nas consultas agendadas foram convidados a participar da pesquisa.

4.3.1 Critérios de inclusão e exclusão

Os pacientes incluídos eram voluntários do sexo masculino, heterossexuais, de 18 anos de idade ou mais, portadores de DRCTC, sem déficits cognitivos ou de comunicação que aceitaram participar do estudo e a assinar o termo de consentimento livre e esclarecido. Não houve restrições quanto ao grupo étnico, estado geral de saúde, às comorbidades ou à classe social. Foram excluídos pacientes com *clearance* de creatinina estimado pela equação de Cockcroft-Gault igual ou maior que 60 mL/min/1,73 m^2,ou os que não tinham disponível todos os dados necessários para a estimativa deste cálculo (peso, idade e valor de creatinina sérica) (COCKCROFT E GAULT, 1976).

4.4 Coleta de dados

A coleta de dados foi realizada pelo pesquisador responsável e por outros quatro pesquisadores. Os pesquisadores preencheram todos os formulários de pesquisa (Formulário 1) e conduziram a aplicação do domínio da função erétil do IIEF (Anexo 2), conforme treinamento prévio realizado pelo pesquisador responsável. De acordo com as instruções recebidas, os pesquisadores foram orientados a convidar, para o consultório, com discrição e individualmente, todos os pacientes masculinos que aguardavam atendimento nos ambulatórios já especificados. Uma breve explicação do que se tratava a pesquisa era feita antes de integrar qualquer paciente ao estudo. Aqueles que se mostravam favoráveis à participação escutavam em voz alta o termo de consentimento livre e esclarecido (Apêndice 1), foram questionados sobre dúvidas e tiveram acesso ao termo para leitura e posterior assinatura. Em seguida, eram entregues aos pacientes, em papel impresso, as questões do domínio da função erétil do IIEF (Anexo 2) para autopreenchimento. Os pacientes foram orientados apenas a ler e interpretar as questões já traduzidas e validadas psicometricamente em português. Enquanto os pacientes respondiam a essas perguntas, os pesquisadores revisavam os respectivos prontuários para preenchimento do formulário de pesquisa (Formulário 1). Ao final da revisão, os pesquisadores regressavam aos pacientes para recolhimento dos questionários e coleta de eventuais dados não encontrados no prontuário, necessários ao preenchimento completo do formulário de pesquisa.

4.4.1 Função erétil

A avaliação da função erétil foi realizada com as seis perguntas do domínio de função erétil (questões números 1 a 5 e questão número 15) IIEF (ROSEN *et al*., 1997) (Quadro 5). De acordo com essa versão, a pontuação para cada alternativa das questões estudadas variava de 0 a 5 para as questões de 1 a 5, e de 1 a 5, para a questão 15. Portanto, a pontuação máxima para o domínio da função erétil foi 30. Pacientes com pontuação entre 25 e 30 foram considerados normais (sem DE) e, entre 1 e 24, portadores de DE. A gravidade da DE, de acordo com a versão utilizada, dependia da pontuação do domínio de função erétil, pontuações de 19 a 24 (leve), 13 a 18 (leve a moderada), 7 a 12 (moderado) e 1 a 6 (grave).

Quadro 5- Índice Internacional de Função Erétil (IIEF) (Domínio da Função Erétil).

Coordenador: _____
Data da visita, período do dia e dia da semana:_____

Pontuação das alternativas nas questões 1, 2, 3, 4 e 5: 0 na primeira, 1 na segunda, 2 na terceira, 3 na quarta, 4 na quinta e 5 na sexta alternativa.
Pontuação das alternativas na questão 6: 1 na primeira, 2 na segunda, 3 na terceira, 4 na quarta e 5 na quinta.
Instruções: Estas questões são referentes à sua **ereção e aos possíveis** problemas que a mesma poderia ter trazido na sua vida sexual nas últimas quatro semanas. Por favor, responda às seguintes perguntas da forma mais honesta e clara possível. Para responder a essas questões, entende-se por:
A atividade sexual inclui relações sexuais, carícias, preliminares e masturbação.
A relação sexual é definida como a penetração vaginal.
Estímulo sexual inclui situações como preliminares com um (a) parceiro (a), olhar fotos eróticas etc.
Ejacular é definido como a expulsão do sêmen do pênis (ou sensação do mesmo).

Marcar apenas um círculo por pergunta:
1. Durante as últimas quatro semanas, com que frequência você foi capaz de conseguir uma **ereção** durante a atividade sexual?
0 Sem atividade sexual .
0 Quase nunca ou nunca.
0 Poucas vezes (muito menos da metade das vezes).
0 Às vezes (cerca de metade do tempo).
0 A maioria das vezes (muito mais que a metade das vezes).
0 Quase sempre ou sempre.

2. Ao longo das últimas quatro semanas, quando você teve **ereções** com estimulação sexual, com que frequência essas **ereções** foram fortes o suficiente para a penetração?
0 Sem atividade sexual.
0 Quase nunca ou nunca.
0 Poucas vezes (muito menos da metade das vezes).
0 Às vezes (cerca de metade do tempo).
0 A maioria das vezes (muito mais que a metade das vezes).
0 Quase sempre ou sempre.

3. Durante as últimas quatro semanas, quando tentou manter relação sexual, com que frequência você foi capaz de penetrar (entrar) no (a) seu (sua) parceiro (a)?
0 Não tentou manter relações sexuais.
0 Quase nunca ou nunca.
0 Poucas vezes (muito menos da metade das vezes).
0 Às vezes (cerca de metade das vezes).
0 A maioria das vezes (muito mais que a metade das vezes).
0 Quase sempre ou sempre.

4. Ao longo das últimas quatro semanas, durante as relações sexuais, quantas vezes você foi capaz de manter a sua **ereção** depois que você tinha penetrado (entrado) em seu (sua) parceiro (a)?
0 Não tentou manter relações sexuais.
0 Quase nunca ou nunca.
0 Poucas vezes (muito menos da metade das vezes).
0 Às vezes (cerca de metade das vezes).
0 A maioria das vezes (muito mais que a metade das vezes).
0 Quase sempre ou sempre.

5. Ao longo das últimas quatro semanas, durante as relações sexuais, o quanto era difícil manter a **ereção** até a conclusão da relação sexual?
0 Não tentou manter relações sexuais.
0 Extremamente difícil.
0 Muito difícil.
0 Difícil.
0 Pouco difícil.
0 Sem dificuldade.

15. Durante as últimas quatro semanas, como você classificaria sua confiança em obter e manter a sua **ereção**?
0 Muito baixo.
0 Baixo.
0 Moderado.
0 Alta.
0 Muito alto.

4.4.2 Dados clínicos

As seguintes variáveis clínicas foram avaliadas: peso, altura, IMC, etiologia da DRC, realização de hemodiálise, tempo de hemodiálise, tempo de diagnóstico de DRC, HAS, tempo de diagnóstico de HAS, DM, tempo de diagnóstico de DM, doenças cardíacas, prostáticas, infecção e litíase urinárias, antecedentes cirúrgicos (fístulas artério-venosas, prostatectomias radicais, ressecções transuretrais da próstata, cirurgias abertas para hiperplasia prostática benigna, colectomias, amputações abdomino-perineais, cirurgias vasculares abdomino-pélvicas) e medicamentos, tais como: anti-hipertensivos (diuréticos, inibidores adrenérgicos, vasodilatadores diretos, bloqueadores de canal de cálcio, inibidores da enzima conversora de angiotensina, bloqueadores do receptor de angiotensina 1, inibidores diretos da renina); psicofármacos (ansiolíticos, anticonvulsivantes, antimanias, antipsicóticos, antidemenciais, antiparkisonianos, antidepressivos) e outras drogas (digitálicos, nitratos, eritropoetina, estatinas, inibidores de 5-alfa-redutase, antiandrógenos periféricos, antiandrógenos centrais) usadas naquele período.

4.4.3 Dados sociodemográficos

As variáveis sociodemográficas avaliadas foram: idade, data de nascimento, estado civil, parceria sexual, nível de escolaridade, uso de drogas ilícitas (tipo de droga, uso atual ou prévio), uso de cigarros (quantidade, uso atual ou prévio e tempo de tabagismo) e uso de álcool (tipo de bebida, frequência, quantidade ingerida, uso atual ou prévio e tempo de uso).

4.4.4 Dados laboratoriais

Os dados laboratoriais incluídos foram: ureia, creatinina, hemoglobina, hematócrito, LDL-colesterol, HDL-colesterol, colesterol total, triglicérides, albumina, cálcio, fósforo, transaminase glutâmica pirúvica, ferritina, ferro, paratormônio e *clearance* de creatinina, estimado pela equação de Cockcroft-Gault. Por meio desse cálculo, os pacientes foram classificados em estadios de DRC, de acordo com o *Kidney Disease Outcome Quality Initiative* (2012). Foram considerados válidos os resultados de provas laboratoriais de amostras sanguíneas coletadas no período de até três meses que antecederam a entrevista com os pacientes. Os exames foram solicitados pelos médicos que acompanhavam o tratamento desses pacientes, de acordo com a necessidade de cada um deles, e nenhuma análise foi requisitada com a finalidade de fornecer dados para esta pesquisa.

4.5 Análise estatística

Inicialmente, os dados foram tabulados no programa Microsoft ® Excel 2007. Posteriormente, esses dados foram transferidos e avaliados pelo programa *Statistical Package for the Social Sciences* 16 para Windows Microsoft. Em seguida, a DE, as categorias de DE, os hábitos de vida, os dados sociodemográficos, clínicos e laboratoriais (todas as variáveis da pesquisa) foram submetidos a uma análise descritiva restrita. As variáveis categóricas foram avaliadas pela proporção de pacientes com e sem DE em cada categoria e as contínuas por essa mesma proporção, só que em categorias criadas para facilitar a interpretação de resultados (Figura 8).

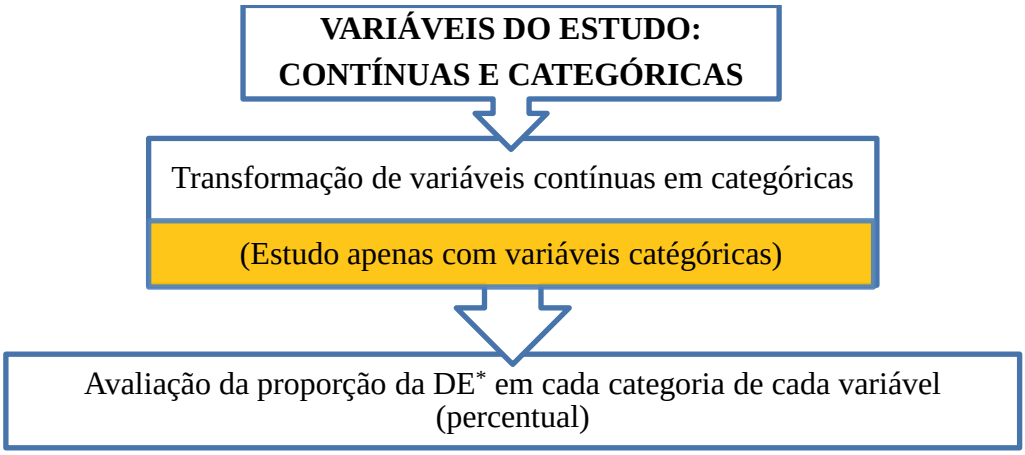

Figura 8- Análise descritiva do estudo. *Disfunção erétil.

Entre os pacientes portadores de DRCTC, definiu-se a associação de possíveis fatores de risco com a DE por meio de análise de regressão logística uni e multivariada. A associação foi expressa por *odds ratios* em intervalos de confiança de 95% e nível de significância estatística de 0,05. Na avaliação individual de cada variável, análise de regressão logística univariada, P menor que 0,05 traduzia a associação de uma ou mais categorias de uma determinada variável com DE, e P menor que 0,2 selecionava as variáveis para outro tipo de avaliação (análise regressão logística multivariada). Nessa análise, as variáveis são estudadas conjuntamente, e P menor que 0,05 significava associação de uma ou mais categorias de uma determinada variável com DE. Neste caso, de modo diferente da análise de regressão logísitica univariada, essa associação ocorria indepentente da influência dos outros fatores que foram analisados em conjunto (Figura 9).

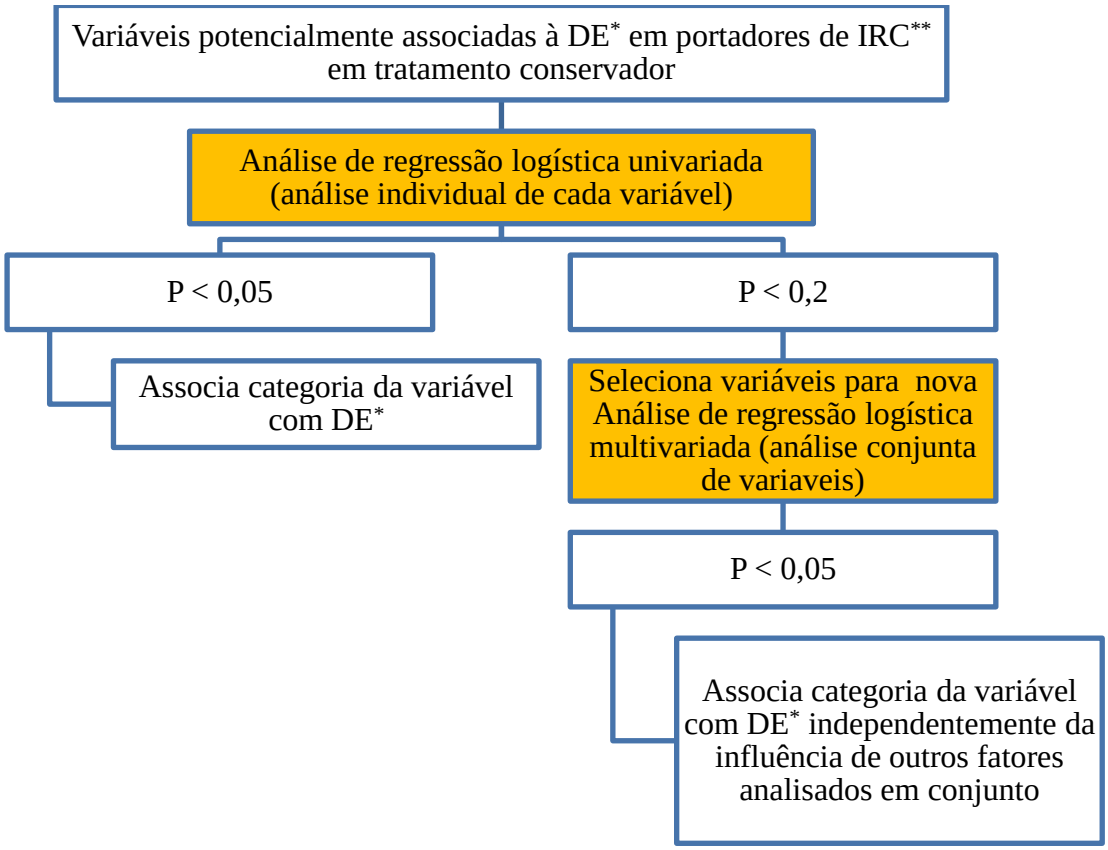

Figura 9- Avaliação de fatores associados à disfunção erétil em portadores de doença renal crônica em tratamento conservador. *Disfunção erétil, **Doença renal crônica.

Os pacientes portadores de DRCTC foram divididos em dois grupos, os com *clerance* de creatinina estimado inferior a 30 mL/min/1,73 m^2 (estágios IV/V) e os com *clearance* igual ou superior a 30 mL/min/1,73 m^2 (estágio III). A DE, os graus de DE e as variáveis classicamente influenciadoras na função erétil foram comparados entres estes dois grupos através do teste de qui-quadrado. Nesta comparação, que faz uma análise individual de cada variável, P menor que 0,05 significava que existia diferença entre as proporções das categorias de uma determinada variável em relação à sua correspondente no outro grupo (Figura 10). Os pacientes também foram analisados dando enfoque especial à DE grave. Nos pacientes no estágio III, a frequência de DE grave foi comparada com os outros graus de DE aplicando o teste de qui-quadrado. Compação semelhante foi realizada nos pacientes estágios IV/V (*clerance* de creatinina estimado inferior a 30 mL/min/1,73 m^2) e em pacientes estágios III/IV/V (todos pacientes em conjunto). Nestes casos, o P menor que 0,05 significava que existia diferença entre a proporção de DE grave em relação ao outro grau de DE avaliado (Figura 11). A relação da pontuação do questionário do IIEF com a TFG foi determinada aplicando-se o coeficiente de correlação de Pearson.

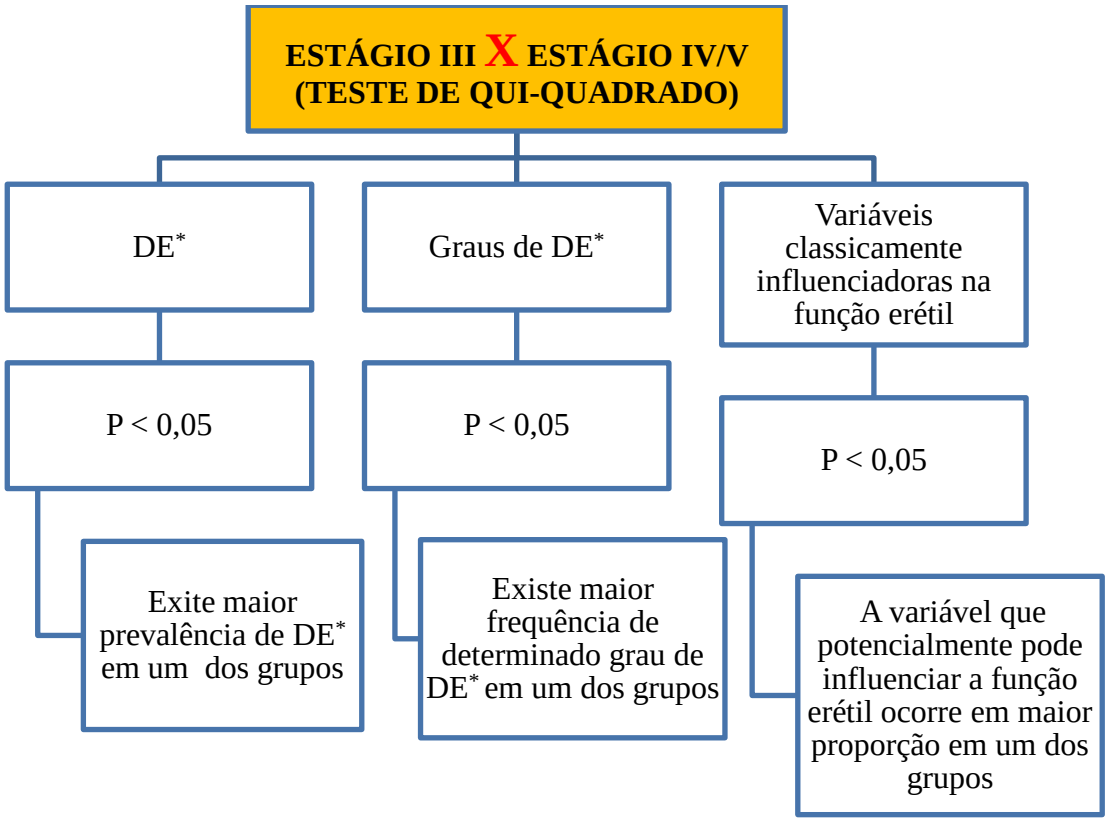

Figura 10- Comparação entre os estágios de doença renal crônica III *versus* IV/V.*Disfunção erétil.

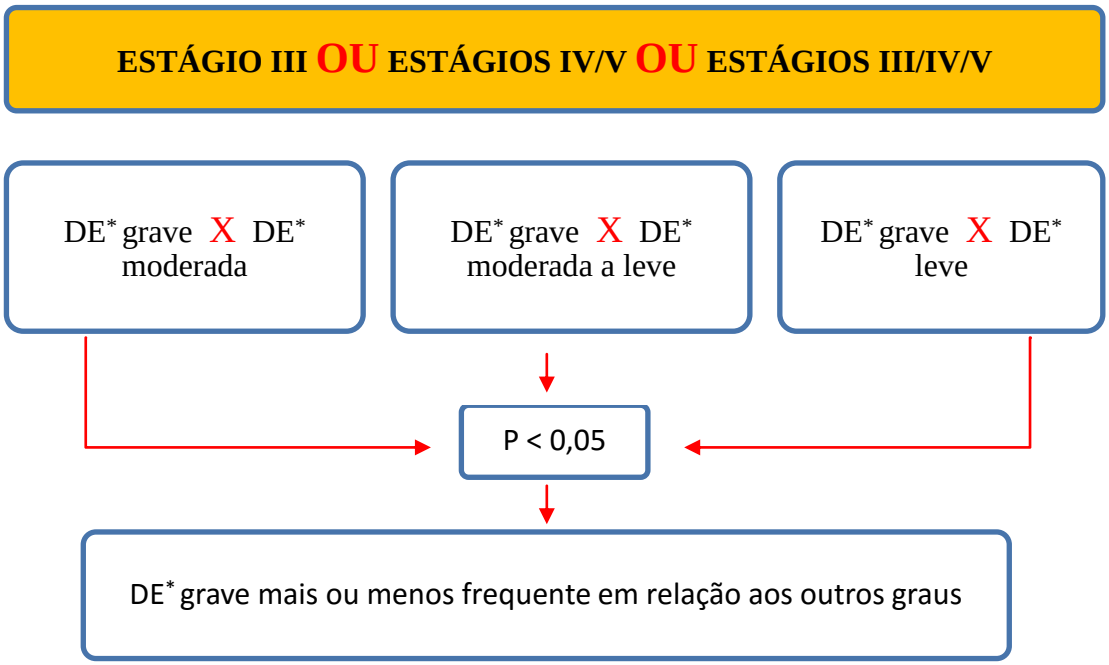

Figura 11- Comparação da disfunção erétil grave *versus* moderada, moderada a leve e leve em diferentes grupos de portadores de doença renal crônica.*Disfunção erétil.

5 PUBLICAÇÕES

5.1 Artigo 1

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Corresponding Author	Prof. Márcio Costa (Medical School of Federal University of Goiás)
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Abstract	Population with chronic kidney disease (CKD) has had many problems, and some of these have arisen from sexual disorders (SD). The present study intends to determine the prevalence and the associated factors with erectile dysfunction (ED) among patients with chronic kidney disease on conservative treatment (CKDCT).This transversal study was conducted from May 2013 to December 2015. The tools used were: medical records and the International Index of Erectile Function (IIEF). Data were analyzed by univariate (ULRA) and multivariate logistic regression analysis (MLRA). Among two hundred and forty five patients that have participated of this study, ED was present in 71.02% and it was severe in 36.73%. Age greater than 50 years, body mass index (BMI) lower than 25, diabetes mellitus (DM), stages IV/V of CKD, cardiac conduction disturbances, benign prostatic hyperplasia (BPH), smoking, alcohol use, albumin less than 3.5g/100 mL and creatinine clearance between 15 and 29 mL/min/1.73 m2 were associated with ED. DM was the only variable associated with ED independent of the presence of other factors. ED prevalence in patients with CKDCT is high and it is severe in more than half of them. Several factors are associated with ED in this population but the principal one is DM.
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Title of the paper: ***"Prevalence and Factors Associated with Erectile Dysfunction in Patients with Chronic Kidney Disease on Conservative Treatment."***

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Running title: ***"Erectile Dysfunction in Chronic Kidney Disease"***

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Abstract

Population with chronic kidney disease (CKD) has had many problems, and some of these have arisen from sexual disorders (SD). The present study intends to determine the prevalence and the associated factors with erectile dysfunction (ED) among patients with chronic kidney disease on conservative treatment (CKDCT). This transversal study was conducted from May 2013 to December 2015. The tools used were: medical records and the International Index of Erectile Function (IIEF). Data were analyzed by univariate (ULRA) and multivariate logistic regression analysis (MLRA). Among two hundred and forty five patients that have participated of this study, ED was present in 71.02% and it was severe in 36.73%. Age greater than 50 years, body mass index (BMI) lower than 25, diabetes mellitus (DM), stages IV/V of CKD, cardiac conduction disturbances, benign prostatic hyperplasia (BPH), smoking, alcohol use, albumin less than 3.5 g/100 mL and creatinine clearance between 15 and 29 mL/min/1.73 m^2 were associated with ED. DM was the only variable associated with ED independent of the presence of other factors. ED prevalence in patients with CKDCT is high and it is severe in more than half of ED carries. Several factors are associated with ED in this population but the principal one is DM.

Introduction

ED is defined as persistent inability to attain and/or maintain erection sufficient for satisfactory sexual function.[1] Incidence in western countries is high between 25-30 new cases per 1000 inhabitants a year.[2] In 1995, it was estimated that about 152 million men had ED worldwide. In 2025, it is expected that the disturbance reaches 322 millions of people.[3]

Although it is a benign condition, the ED can affect men physical, mental and socially and, thus, it triggers anxiety, tension and problems of self-esteem.[4] Beyond bringing significant negative impact on quality of life for them and their partners, ED may represent a risk factor for depression, one of the most commonly comorbidities described among these men.[4-6]

The prevalence of ED in CKD carriers on conservative treatment (CT) varies widely. The first assessment of SD in this population occurred in 1973. In that study the prevalence of sexual problems was estimated in 9% in pre-dialytic patients of both sexes.[7] As new studies were conducted, there was a tendency to

increased ED prevalence, such that there are records of up to 84% of this disorder in CKD carriers on CT.[8]

Incoherence of data about SD in this population is not restricted only to the prevalence. Factors that influence the presence and severity of ED in CKD carriers on CT are also inconsistent. Although risk factors well known for SD in the general population, such as DM and aging, are almost unanimously accepted as important in CKD carriers, several other comorbidities, life habits, sociodemographic data and the own stages of CKD have not defined the role yet.[9-24]

According to what was reported, ED is very frequent, and many problems in CKD carriers are arising out of it. The ED prevalence among these patients is widely variable and the factors associated are inconsistent. In this way, we intend to clarify these uncertain issues and determine the prevalence and the associated factors to ED among men with CKDCT.

Material and methods

Study design and ethical aspects

This is a cross-sectional observational study conducted from May 2013 to December 2015. The Ethics Committee of the Clinical Hospital of Federal University of Goiás approved the study protocol (document no. 090/2011).

Population and sample

Male patients with CKDCT have composed the target population of this study. The sample was obtained from outpatient with scheduled medical appointment in nephrology services of two hospitals in the city of Goiânia (Brazil).

The sample studied consisted of male volunteer patients, heterosexual, 18 years of age or older, with CKDCT, without cognitive or communication impairment and that sign the clear consent form. We have excluded patients with creatinine clearance estimated by the Cockcroft-Gault equation equal to or greater than 60 mL/min/1.73 m^2 or still, those who have not had all necessary available data for the estimation of this calculus (weight, age and serum creatinine value).

Data collection

The patients were individually approached by a researcher before medical visit in the nephrology services cited. They were accepted to the study only after a

brief explanation about the research. All participants were instructed to read and interpret the questions of EF of IIEF. Life habits, sociodemographic, clinical and laboratory data were obtained by medical record review.

Erectile function measure

These dates were carried out with the EF domain of IIEF (1997) (question numbers 1 to 5 and 15). The score for each alternative has ranged of 0 to 5 (questions 1 to 5) and of 1 to 5 (question 15). Patients with a total score between 25 and 30 were considered normal (without ED) and, between 1 and 24, ED carriers. The ED was classified according to the score, from 19 to 24 (mild ED), 13 to 18 (mild to moderate), 7 to 12 (moderate) and 1 to 6 (severe).

Life habits, sociodemographic, clinical and laboratory data

The life habits and sociodemographic variables evaluated were: age, marital status, educational level, cigarette smoking (quantity, current or previous history and usage time) and alcohol use (frequency, quantity, current or previous history and usage time).

The following clinical variables were evaluated: BMI, etiology and diagnosis time of CKD, systemic arterial hypertension (SAH), diagnosis time of SAH, DM, diagnostic time of DM, heart and prostate previous disease, medications used at that time.

Laboratory data included: urea, creatinine, hemoglobin, hematocrit, low density lipoprotein (LDL)-cholesterol, high density lipoprotein (HDL)-cholesterol, total cholesterol, triglyceride, albumin, parathyroid hormone and clearance creatinine estimated by the equation Cockcroft-Gault.

After the calculus of creatinine clearance, the patients were classified in stages of CKD according to Kidney Disease Outcomes Quality Initiative (KDOQI).[25] Blood samples taken during the period up to 3 months prior to the interviews with the patients were considered valid.

Statistical analysis

Data were tabulated in Microsoft ® Excel 2007 and analyzed by the Statistical Package for Social Sciences for Windows 16. A descriptive analysis for life habits, sociodemographic, clinical and laboratory data and for the categories of

ED according to EF available on IIEF was done for all patients. In order to interpret results, continuous variables were transformed into categorical ones (continuous data were divided into intervals that represented categories). All variables were assessed by the proportion of ED in each category.

ULRA and MLRA were initial strategies for analytical statistical study. In these analyzes, the association among variables were expressed as odds ratios with 95% confidence intervals. The variables were analyzed individually in ULRA. In this statistical test, a category was associated with ED when P was less than 0.05. When P was less than 0.20, the variable was selected for MLRA. The variables were analyzed together in MLRA. In this evaluation, when P was less than 0.05 in a variable, it has meant that there was a category associated with ED independent of influence of others variables analyzed together.

Severe ED was compared with others ED degrees using Chi-square. P equal or less than 0.05 has meant that severe ED frequency was statistically different from others ED degrees.

Results

In this study, a total of 338 patients were asked to participate. Among them, 245 have effectively participated. The reasons for exclusion were described below (Figure 1). ED was present in 174 (71.02%) patients and distributed according to the degree, as in figure 2.

The average age of participating patients was 65.11 ± 13.98 years, 59.05% were married and only 16.73% of patients have completed or reached over than high school. In terms of clinical data, 41.20% patients have had unknown cause of kidney disease, 84.08% SAH, 34.28% DM, 41.22% heart disease, 92.24% have used at least one antihypertensive medication and just 1.22% have used phosphodiesterase 5 inhibitor. It was found previous or current history of cigarette and alcohol use in respectively 67.75% and 74.69% of patients.

In an analysis of each variable studied, without ruling out any influence of one on the other, ED was associated with age greater than 50 years (Table 1), BMI lower than 25, DM, stages IV/V of CKD, cardiac conduction disturbances, BPH (Table 2), current or previous history of smoking, smoking time greater than 10 years, pack-year index greater than or equal to 20, time of alcohol use greater than 10 years (Table 3), albumin less than 3.5 g/100 mL and levels of creatinine

clearance between 15 and 29 mL/min/1.73 m^2 (Table 4). No association of ED with medications, number of anti-hypertensive used (three or more) or causes of CKD were identified.

Twenty four variables have met the criteria to be assessed by MLRA (P less than 0.2 in URLA), twenty two showed in Tables 1, 2, 3 and 4 and two (use of thiazide diuretic with P = 0.152 and of alpha-blockers P = 0.117 not presented in Tables) were analyzed by MLRA. In this assessment, the only variable independently associated with ED was DM.

Discussion

The prevalence of ED in population with CKDCT ranged from 9 to 84%.[7,8,26-29] This wide variability occurs due to several factors. Patients were different in many aspects that could affect the EF (example: age and severity of CKD); the methods of ED evaluation were different among the studies; the definitions and assessment tools for ED were not uniform; some studies have had an insignificant number of patients and none has had randomized samples.[7,8,26-29] In our study we have found a prevalence of 71.02% of ED in 245 patients with CKDCT.

Among many factors that could affect the EF, age more than 50 years was associated with ED in our study. Although not all the studies have the same result, a lot of researches have this kind of association.[10,11,14,22,30] This positive correlation may be justified because of other comorbidities (such as atherosclerosis), frequently present in old patients involved in the process of SD.[13,31] No association between ED and aging may occur as a consequence of a small number of patients included in some studies.[10]

Controversies in the results between BMI levels and ED have been observed. Stolic and Bukumiric[13] in a research involving 73 men who have underwent hemodialysis chronically have found ED more frequent in patients with higher BMI. Obese patients are more likely to have comorbidities (such DM, SAH, etc), which are often present in patients with SD.[32,33] However, Malekmakan et al.,[14] similar to what was verified in our study, have observed correlation of ED with lower BMI. In the same way, other marker of nutrition status in our work, serum albumin, has had a negative correlation with EF. Patients with albumin lower than 3.5 g/100 mL have had higher frequency of ED. Similarly, this association was verified in another study of patients with CKD.[22]

DM, considered a potential risk factor for ED, is very frequent among patients with CKD and is one of the most common causes of this disease.[16] Similar to our results, a lot of studies have demonstrated correlation between ED and DM, identifying the metabolic disorder as an independent risk factor for SD in patients with CKD.[10,15,23,24,30,34] DM causes oxidative stress, cavernosal hypercontractility and nitrergic/endothelial/veno-occlusive dysfunction that triggers ED.[34]

Association among higher stages of CKD, lower glomerular filtration rate (GFR) and the presence of ED was verified in our study. Rathiet al.[35] have explained this as a consequence of injuries, caused directly by the CKD in penis. Despite of this, the connection of SD with alterations of renal function was not observed in all researches.[8-10,35-37]

Cardiovascular diseases are commonly related to SD. Our study has showed a direct correlation between cardiac conduction disorders and ED. According to Platek et al.,[38] SD and many cardiovascular diseases have pathophysiological mechanisms in common (low-grade inflammation process, endothelial dysfunction, oxidative stress, hemodynamic and vascular alterations) that can be the cause and/or consequence of atrial fibrillation. Classical cardiovascular risk factors highly prevalent in atrial fibrillation are probably the cause of ED, but the impact of this cardiac conduction disorder in SD cannot be underestimated.[38]

Although correlation of BPH with ED is controversial, the present study has showed a higher frequency of SD in patients with BPH.[13,30,39,40] Shimizu et al.[41] suggest that cardiovascular risk factors would arise with aging and would lead to a decrease in systemic blood flow. Chronic ischemia in pelvic organs and penis would induce mild hypoxia and possibly cause SD and BPH.[41]

Association between ED and smoking is frequent, but in patients with CRF is questionable.[10-14,22-24,42-44] In present study, ED was related to history of smoking. The tobacco usage may decrease the penile nitric oxide synthase (NOS) activity and neuronal NOS expression, alter down regulation of nitric oxide/cyclic guanosine monophosphate pathway in penile tissue (probably due to increased oxidative stress) and enhance activity and expression of arginase with an increase of the content of the asymmetric dimethylarginine, endogenous NOS inhibitor.[34] Nitric oxide in the corpus cavernosum is the main neurotransmitter of erection.

Alcohol consumption is also often associated to sexual problems.[5,45] For patients with CKD, this association is uncertain and even controversial.[12,13,22-24,30,44,46,47] Improvement of sexual performance by the consumption of alcoholic drinks has been related.[23] In this research, ED was related to time of alcohol use greater than 10 years. According to Muniz et al.[45] the ethanol increases the contraction induced by endothelin-1 (potent vasoconstrictor) in corpus cavernosum through activation of mechanisms that inhibit the erection (reduction of vasodilator prostanoids and hydrogen peroxide and increase of activation of RhoA/Rho-kinase pathway).

The results observed in our study should be accepted with some considerations. The IIEF (major research tool of this work) evaluates sexual function in a limited period of time (four weeks). The answers to the IIEF may have been influenced by preconceptions and concerns with the stigma of being a carrier of ED (despite the anonymity has been guaranteed). The research itself has not assessed some variables potentially associated with ED (depression, testosterone, prolactin, zinc, thyroid hormones, abuse of illegal substances, autonomic neuropathy, peripheral vascular disease, anxiety etc.) nor has the influence of time and quality of relationships on sexual function. ED measurements were based on self-reports and not in diagnostic tests. Lastly, the methodological design of the study (transversal) has not been yielded to define causal relation between ED and others variables, only associations. Despite all these caveats, this study has positive points. The assessment of the prevalence and factors associated with ED in patients with CRF on conservative treatment is a scarce theme in literature and, according to our knowledge, the sample studied in our study is the largest described up to now.

Conclusions

The prevalence of ED observed in patients with CKDCT is high and severe in more than a half of ED carries. So, this study can alert the physicians and health professionals about the importance of sexual problems in this population.

Age greater than 50 years, BMI lower than 25, stages IV/V of CKD, cardiac arrhythmias, BPH, current or previous history of smoking, smoking time greater than 10 years, pack-year index greater than or equal to 20, time of alcohol use greater than 10 years, albumin less than 3.5 g/100 mL, creatinine clearance

between 15 and 29 mL/min/1.73 m^2 and mainly DM are associated with ED in patients with CKDCT. So, paying attention to these factors enables the early diagnosis and treatment of this condition and may probably improve the quality of life of this population.

Conflict of interest

The authors declare no conflict of interest.

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Tables

Table 1 - Association of sociodemographic data with erectile dysfunction in patients with chronic kidney disease on conservative treatment.

Sociodemographic data	With ED		Without ED		P-values*	OR (CI 95%)
	n	%	n	%		
Age (years)						
<50	15	8.6	20	28.2		
≥ 50	159	91.4	51	71.8	0.000	0.24 (0.11 - 0.50)
Marital status						
Not married	73	42.0	22	31.0		
Married	101	58.0	49	69.0	0.111	1.61 (0.90 - 2.89)
Graduation						
Maximum up to elementary school	106	82.8	45	70.3		
More than elementary school	22	17.2	19	29.7	0.111	1.61 (0.90 - 2.89)

*Estimated by univariate logistic regression analysis; ED = Erectile dysfunction; OR = Odds ratio; P = Statistical significance; 95% CI = 95% confidence interval.

Table 2 - Association of clinic data with erectile dysfunction in patients with chronic kidney disease on conservative treatment.

Clinic data	With ED		Without ED		P-values*	OR (CI 95%)
	n	%	n	%		
Body Mass Index						
<25	93	54.1	28	39.4		
≥ 25	79	45.9	43	60.6	0.039	1.81 (1.03 - 3.17)
Arterial hypertension						
Yes	147	84.5	59	83.1		
No	27	15.5	12	16.9	0.788	1.11 (0.53 - 2.33)
Hypertension time (years)						
<10	62	44.0	27	45.0		
≥ 10	79	56.0	33	55.0	0.893	0.96 (0.52 - 1.76)
Anti hypertensive (number)						
≤ 3	145	83.3	57	80.3		
> 3	29	16.7	14	19.7	0.569	1.23 (0.61 – 2.49)
Diabetes						
Yes	68	39.1	16	22.5		
No	106	60.9	55	77.5	0.015	2.21 (1.17 - 4.15)
Time of diabetes (years)						
< 10	17	25.8	3	20.0		
≥ 10	49	74.2	12	80.0	0.642	1.39 (0.35 - 5.51)
Chronic renal disease (stage)[a]						
III	80	46.0	49	69.0		
IV/V	94	54.0	22	31.0	0.001	0.38 (0.21 - 0.69)
Chronic renal disease (years)						
<10	138	84.7	51	76.1		
≥ 10	25	15.3	16	23.9	0.127	1.73 (0.86 - 3.50)
Coronary artery disease						
Yes	30	17.8	7	9.9		
No	139	82.2	64	90.1	0.128	1.97 (0.82 - 4.73)
Congestive heart failure						
Yes	22	13.0	5	7.0		
No	147	87.0	66	93.0	0.188	1.98 (0.72 - 5.44)
Cardiac arrhythmias						
Yes	28	16.6	4	5.6		
No	141	83.4	67	94.4	0.030	3.33 (1.12 - 9.86)
Cardiac valve disorders						
Yes	17	10.1	3	4.2		
No	152	89.9	68	95.8	0.148	2.54 (0.72 - 8.93)
Benign prostatic hyperplasia						
Yes	63	36.2	14	19.7		
No	111	63.8	57	80.3	0.013	2.31 (1.19 - 4.47)
Prostate cancer						
Yes	12	6.9	1	1.4		
No	162	93.1	70	98.6	0.117	5.19 (1.19 – 40.64)

*Estimated by univariate logistic regression analysis; [a]Classification according to Kidney Disease Outcomes Quality Initiative; ED = Erectile Dysfunction; OR = Odds ratio; P = Statistical significance; 95% CI = 95% confidence interval.

Table 3 - Association of smoking and alcohol use with erectile dysfunction in patients with chronic kidney disease on conservative treatment.

Life habits	With ED		Without ED		P-values*	OR (CI 95%)
	n	%	n	%		
Active or former smoker						
Yes	127	73.0	39	54.9		
No	47	27.0	32	45.1	0.007	2.22 (1.25 - 3.94)
Active smoker[a]						
Yes	20	11.5	4	5.6		
No	154	88.5	67	94.4	0.170	2.18 (0.72 - 6.60)
Former smoker[b]						
Yes	107	61.5	35	49.3		
No	67	38.5	36	50.7	0.080	1.64 (0.94 - 2.86)
Smoking time (years)						
< 10	8	6.3	11	28.2		
≥ 10	119	93.7	28	71.8	0.001	0.17 (0.06 - 0.46)
Pack-year index						
< 20	38	29.9	20	51.3		
≥ 20	89	70.1	19	48.7	0.016	0.41 (0.19 - 0.84)
Current or former alcohol user						
Yes	131	75.3	52	73.2		
No	43	24.7	19	26.8	0.738	1.11 (0.59 - 2.08)
Current alcohol user[c]						
Yes	23	13.2	12	16.9		
No	151	86.8	59	83.1	0.456	0.75 (0.35 - 1.60)
Former alcohol user[d]						
Yes	108	62.1	40	56.3		
No	66	37.9	31	43.7	0.406	1.27 (0.72 - 2.22)
Pattern of current or previous alcohol use						
Moderate[e]	53	30.5	19	26.8		
Excessive[f]	78	44.8	33	46.5		
No alchool user[g]	43	24.7	19	26.8	0.581	1.11 (0.76 - 1.61)
Time of alcohol use (years)						
< 10	10	7.7	11	21.2		
≥ 10	120	92.3	41	78.8	0.013	0.31 (0.12 - 0.78)

*****Estimated by univariate logistic regression analysis; [a]Smokers that have smoked more than 100 cigarettes and currently smoke; [b]Smokers that have smoked or had smoked up to 100 cigarettes and currently do not smoke; [c]Currently they use alcohol regularly; [d]Currently they do not use alcohol but had already regularly used; [e]Regular or previously use of alcohol up to 2 doses (350 mL of beer or 150 mL of wine or 50 mL of distilled)/day; [f]Regular or previously use of alcohol, 5 doses/occasion or more/at least 1 time/week or three or more doses daily; [g]Never used alcohol. ED = Erectile Dysfunction; OR = Odds ratio; P = Statistical significance; 95% CI = 95% confidence interval.

Table 4 - Association of laboratory data with erectile dysfunction in patients with chronic kidney disease on conservative treatment.

Laboratory data	With ED		Without ED		P-values*	OR (CI 95%)
	n	%	n	%		
Hemoglobin (g/dL)						
< 10	11	6.4	6	8.5		
≥ 10	161	93.6	65	91.5	0.569	0.74 (0.26 - 2.08)
Hematocrit (%)						
< 30	12	6.9	6	8.5		
≥ 30	161	93.1	65	91.5	0.682	0.81 (0.29 - 2.24)
Albumin (g/100 mL)						
< 3.5	33	25.0	4	8.2		
≥ 3.5	99	75.0	45	91.8	0.018	3.75 (1.25 - 11.21)
Cholesterol (mg/dL)						
< 200	124	75.2	50	73.5		
≥ 200	41	24.8	18	26.5	0.796	1.09 (0.57 - 2.07)
Cholesterol HDL (mg/dL)						
< 40	82	50.3	30	43.5		
≥ 40	81	49.7	39	56.5	0.342	1.32 (0.75 - 2.31)
Cholesterol LDL (mg/dL)						
< 130	124	76.1	50	76.9		
≥ 130	39	23.9	15	23.1	0.892	0.95 (0.48 - 1.88)
Triglycerides (mg/dL)						
< 150	107	64.5	37	53.6		
≥ 150	59	35.5	32	46.4	0.122	1.57 (0.89 - 2.77)
Urea (mg/dL)						
< 100	138	80.2	59	83.1		
≥ 100	34	19.8	12	16.9	0.604	0.83 (0.40 - 1.70)
Creatinine (mg/dL)						
< 2.5	108	62.1	41	57.7		
≥ 2.5	66	37.9	30	42.3	0.530	1.20 (0.68 - 2.10)
Parathormone (pg/mL)						
< 100	79	59.8	35	60.3		
≥ 100 e <300	45	34.1	16	27.6		
≥ 300	8	6.1	7	12.1	0.584	1.14 (0.71 – 1.84)
Creatinine clearance (mL /min/1 .73 m^2)[a]						
0 a 14	14	8.0	5	7.0		
15 a 29	80	46.0	17	23.9		
30 a 44	47	27.0	23	32.4		
45 a 59	33	19.0	26	36.6	0.002	1.66 (1.21 - 2.26)

*Estimated by univariate logistic regression analysis; [a]Estimated by the equation Cockcroft-Gault; ED = Erectile Dysfunction; OR = Odds ratio; P = Statistical significance; 95% CI = 95% confidence interval; SD = Standard deviation.

Figure

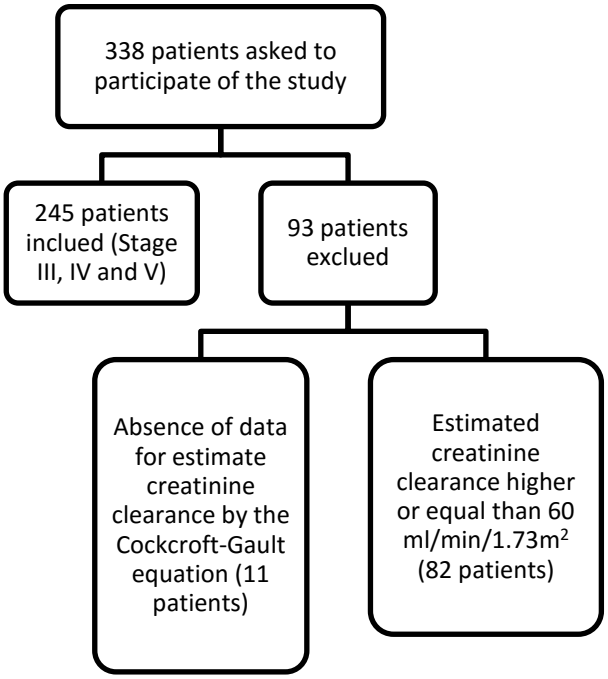

Figure 1- Patients with chronic kidney disease, organizational chart of inclusion and exclusion and distribution on stages.

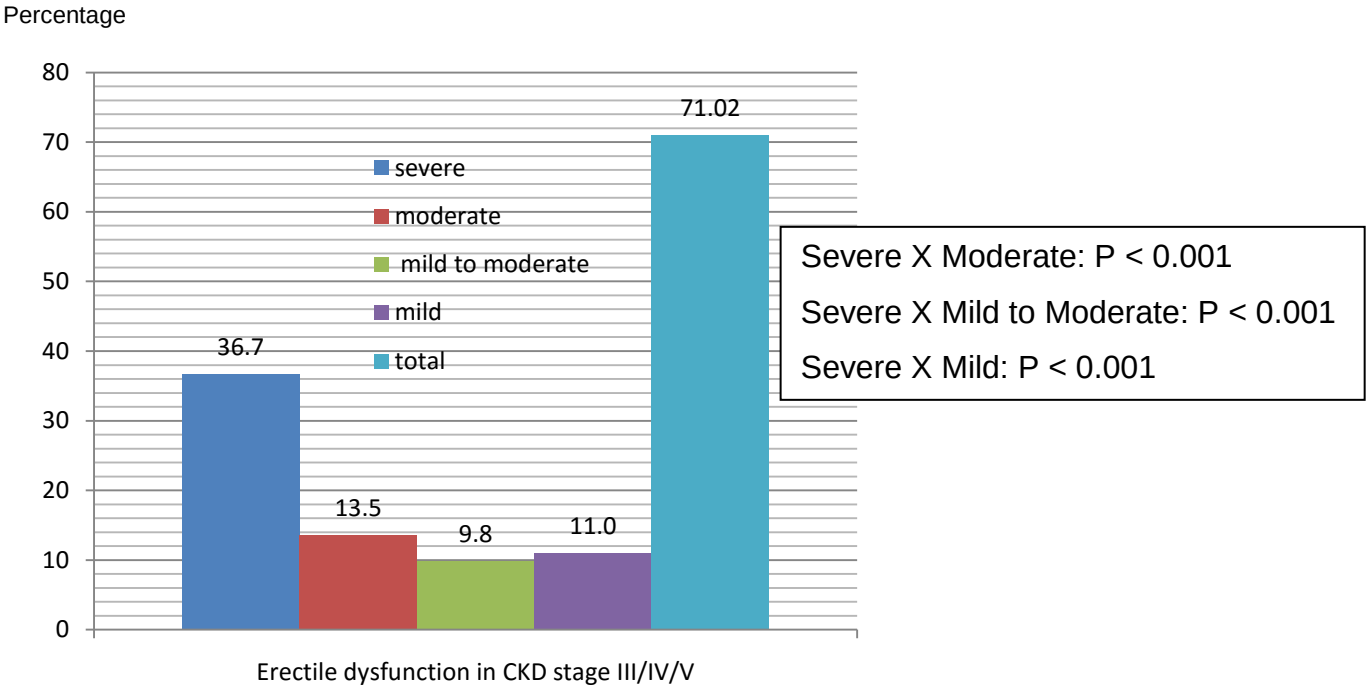

Figure 2- Comparison of severe *versus* moderate, mild to moderate and mild erectile dysfunction in patients with CKD on conservative treatment on stage III/IV/V. Estimated by chi-square test; P = Statistical significance; CKD = Chronic Kidney Disease.

5.2 Artigo 2

AJA

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"Stage effect of chronic renal failure in erectile function"

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Abstract

This study aims to assess the influence of the stage of chonic kidney disease and glomerular filtration rate on the prevalence and degree of erectile dysfunction. This is a transversal study conducted from May 2013 to December 2015. Patients with chronic kidney disease on conservative treatment in stages III/IV/V were included. The erectile dysfunction was evaluated by International Index of Erectile Function. Data classically associated with erectile dysfunction were obtained by medical record review. ED, degree of ED and main variables associated with ED were compared among patients with chronic kidney disease on conservative treatment stages III versus IV/V using Chi-square test. The relationship between the score of International Index of Erectile Dysfunction and the glomerular filtration rate was established by Pearson correlation coefficient. P equal or less than 0.05 was considered statistically significant. Two hundred and forty five patients with chronic kidney disease on conservative treatment have participated of the study. The prevalence of erectile dysfunction in patients with chronic kidney disease on stages IV/V was greater than on stage III. Severe, moderate, mild to moderate and mild erectile dysfunctions were similar between patients on stage III and IV/V. Glomerular filtration rate has showed a positive correlation with the score of the International Index of Erectile Dysfunction. This study suggests that the low glomerular filtration rate and advance chronic kidney disease stages worsen the erectile function.

Keywords: chronic renal insufficiency, chronic kidney disease, end stage kidney disease, erectile function, erectile dysfunction, sexual function.

Introduction

Erectile dysfunction (ED) is a persistent inability to attain and/or maintain an erection sufficient to satisfactory sexual performance.[1] This sexual disorder may bring impairments for quality of life and health status of their carriers and so, it must be promptly investigated and treated.[1-3] By the way, in investigation of ED, it is possible found chronic kidney disease (CKD) as cause of this sexual dysfunction.[4]

The renal disease is a high prevalence disorder.[4] Therefore, all aspects of the disease (causes and consequences) must be evaluated to provide a better treatment for its carriers. In this way, ED, a consequence frequently neglected in patients with CKD, should not be forgotten.[5]

There are some studies that evaluated chronic kidney disease on conservative treatment (CKDCT) with ED. These researches have found ED prevalence variable, almost always high.[7-11] Draws attention, controversies of scientific literature about aspects that could influence ED prevalence, especially the CKD stages and the glomerular filtration rate (GFR). A research in the *Pubmed* and *Capes Periodical* databases, crossing the following mesh terms and descriptors "renal chronic insufficiency", "chronic kidney disease", "end stage kidney disease", “erectile function”, "erectile dysfunction," "impotence", "sexual disturb", "sexual disorder", “sexual dysfunction” and “sexual function” have identified some studies about the influence of CKD stages and the GFR on erectile function. There was not one unanimous response.[6,8,12-15] Therefore, in an attempt to clarify this point, our study has evaluated the influence of CKD stages and GFR on the prevalence and degree of ED.

Material and methods

This is a transversal study conducted from May 2013 to December 2015. The present study was approved under registration no. 090/2011 by the Ethics Committee of the Federal University of Goiás Clinical Hospital, in accordance with the Helsinki Declaration of 1975 revised in 1983.

Male volunteers, heterosexual, carriers of CKDCT patients, from two hospitals located in the city of Goiânia (Brazil), without cognitive or communication

impairment and that signed informed consent form were included in this study. These same patients had data collected to another research that were not present in this work.

Patients with creatinine clearance estimated by the Cockcroft-Gault equation greater than or equal to 60 mL/min/1.73 m^2 or without data (weight, age or serum creatinine value) for estimate it were excluded.

These patients were individually approached before their scheduled medical visit in the nephrology services previously cited. They have received a brief explanation about the research and were instructed to read and interpret the questions of erectile function of the International Index of Erectile Function (IIEF). Life habits, sociodemographic characteristics, clinical and laboratory data were obtained by medical records review made by five researches.

The variables evaluated were: age, marital status, body mass index, systemic arterial hypertension, diabetes mellitus, coronary artery disease, congestive heart failure, time of CKD, smoking, pack years of smoking, alcohol use, number of antihypertensives, antidepressants and anxiolytics use, hematocrit, cholesterol, high density lipid cholesterol, low density lipid cholesterol and triglycerides.

ED was assessed by the erectile function domain of IIEF (questions numbers 1 to 5 and 15). According to the answers of the questions, patients have obtained scores of 1 to 30. Patients were classified according to their scores as follows: no ED (score 25 to 30); mild ED (score 19-24); mild to moderate ED (score 13 to 18); moderate ED (score 7-12) and severe ED (score 1-6).

Data were tabulated in Microsoft ® Excel 2007 and analyzed by the Statistical Package for Social Sciences for Windows 16. Descriptive analysis was done for ED and its categories, according to IIEF and for life habits, sociodemographic characteristics, clinical and laboratory data. Categorical variables were assessed by the proportion of ED in each category and continuous variables by proportion of ED in categories created to facilitate interpretation of results. Prevalence of ED, ED degrees and the categories of each variable were compared with its correspondent between patients with CKDCT stage III versus IV/V using Chi-square test. Severe ED was compared with others ED degrees in patients on stage III using the previous test. Patients on stage IV/V were grouped and the similar comparison was done. P equal or less than 0.05 was considered

statistically significant. The relationship between IIEF score and GFR was established by Pearson correlation coefficient.

Results

The study has assessed 338 patients with CKDCT. 72.49% patients (245) were included. 27.51% of patients were excluded because they have not had all data needed to estimate creatinine clearance or have had creatinine clearance estimated greater than or equal to 60 mL/min/1.73 m^2.

The average age of patients was 63.36 ± 13.74, 67.16 ± 14.43 and 66.52 ± 12.27 years in stages III, IV and V of CKD, respectively. The mean of estimated creatinine clearance was 33.34, 23.07 and 12.14 mL/min/1.73 m^2 in this same stages order. The CKD stages, ED and severe ED were distributed as described below (Fig 1). The frequency of severe ED was higher than in others ED degrees in patients with CKD stage III, this occurs also in patients with CKD stage IV/V (Fig 2 and 3).

The potential factors that can influence erectile function have occurred in similar frequency in the group of patients with CKD stage III compared to the group of patients with CDK stage IV/V. Only body mass index was not similar between them (Table 1).

The proportion of ED in the group of patients with CKD stage III was lower than in the group of patients stage IV/V (Figure 4). However, the degree of ED between groups of patients with CKD stage III and CKD stages IV/V did not differ (Fig 5).

The increase of IIEF score has followed the increase of GFR (P = 0.002). This relationship was weak (r = 0.200).

Discussion

The first reference of sexual disorders prevalence on CKDCT estimated 9% in both sexes.[9] Evaluation of 25 male uremic patients on conservative treatment has showed ED in 40% of them.[10] Erectile disorders, before starting treatment with hemodialysis, were reported in 41.5% of 53 men with CKD.[11] ED was refereeing approximately 30% of all uremic patients under conservative treatment.[7] Analysis of 81 outpatients with CKDCT in stages III, IV and V observed ED in 76.5% of them. EDs were mild, mild to moderate, moderate and severe in

29.6%, 18.5 %, 16% and 12.3% of patients, respectively.[6] A study of 26 men with estimated GFR between 15 and 90 /min/1.73 m^2 has found ED prevalence in 84%.[8] Severe ED was reported in 20% of 15 pre-dialysis men with ED.[16] In this present study, it was observed high ED prevalence on patients with CKDCT; in stages III, IV and V, ED was 62.02 %, 82.48% and 73.68%, respectively. The severe ED was present in more than a half of the patients with CKDCT on stage V.

The influence of CKD stages and GFR in erectile function was registered in some studies.[9,12,14,15,17] Among 287 men on hemodialysis, 137 (48%) reported worsening or apparent worsening of sexual function with the progression of uremia before starting hemodialysis.[9] Reduction of sexual potency after onset of renal disease was reported in 45% of 32 male married patients on dialysis.[17] Preliminary results of outpatient with CKD in stages III and IV have showed a direct correlation between IIEF and GFR.[15] ED was correlated with lower GFR in patients with coronary disease in a single artery in analysis of 183 men who have undergone coronary angiography owing to detect acute myocardial infarction.[12] Patients with DM type 2 have had ED associated with albuminuria and lower GFR levels.[14]

The influence of CKD stages and GFR in erectile function is not always found. DE was observed on 72.3%, 81.5% and 85.7% of 81 outpatients with CKD in stages 3, 4, and 5, respectively. These stages have not shown statistical difference in ED prevalence.[6] Male patients with estimated GFR between 15 and 90 mL/min/1.73 m^2 (26 patients) were compared with age-matched controls (20 patients) with estimated GFR equal or greater than 90 mL/min /1.73 m^2. ED was found in 84% and 75% of patients, respectively. These rates did not represent a statistical difference.[8] Patients with type 2 diabetes have had ED associated with microangiopathy and diabetic retinopathy, but not with the GFR levels.[13]

The present study has found worse of ED with the progression of the CKD. The association between CKD and ED may be explained by endothelium dysfunction caused by systemic arterial hypertension, diabetes mellitus and atherosclerosis that are often present in both conditions.[18] Alternatively, this association could also be explained as a consequence of injuries caused directly by the CKD, as decreased penile arterial blood flow, penile venous leakage due to shunts, altered penile smooth muscle function, hormonal disturbances, side effects of medications and neurogenic dysfunction.[19]

The results of this study should be viewed with caution. This is an observational study with non-random sample and without evaluation of variables that are cited as influencers on EF (prolactin, testosterone and zinc levels etc.).[20,21]

In conclusion, this study suggests that low GFR and advance CKD stages worsen the erectile function. So, hypothetically, the diagnosis and treatment of ED may be anticipated with the analysis of CKD progression.

Author Contributions

MRC performed the conception and design of the study and participated in acquisition, analysis and interpretation of data; VCP performed the conception and design of the study and participated in analysis and interpretation of data; TRC, AMO and CPG participated in acquisition, analysis and interpretation of data; ECO performed the conception and design of the study and participated in analysis and interpretation of data. All authors read, revised and approved the final manuscript.

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Table

Table 1 - Patients with chronic kidney disease on conservative treatment, stage III versus stage IV/V. Pairing among main variables that can influence the erectile function.

Data	Category of chronic renal disease (stage)[a]				P-values[*]
	III		IV/V		
	n	%	n	%	
Age ≥ 50 years	109	84.5	101	87.1	0.566
Married status	86	66.7	64	55.2	0.065
Body Mass Index ≥ 25	72	56.3	50	43.5	0.047
Arterial hypertension	107	82.9	99	85.3	0.608
Arterial hypertension ≥ 10 years	61	57.5	51	53.7	0.582
Diabetes	49	38.0	35	30.2	0.198
Diabetes ≥ 10 years	34	72.3	27	79.4	0.466
Coronary artery disease	22	17.3	15	13.3	0.386
Congestive heart failure	14	11.0	13	11.5	0.906
Chronic renal disease ≥ 10 years	18	15.3	23	20.5	0.296
Active smoker[b]	9	7.0	15	12.9	0.117
Pack-year index ≥ 20	57	65.5	51	64.6	0.897
Current alcohol user[c]	22	17.1	13	11.2	0.192
Antihypertensive ≥ 4	21	16.3	22	19.0	0.581
Anxiolytic	10	7.8	4	3.4	0.147
Antidepressive	14	10.9	9	7.8	0.407
Hematocrit ≥ 30%	122	95.3	104	89.7	0.091
Cholesterol ≥ 200 mg/dL	29	23.6	30	27.3	0.517
Cholesterol HDL < 40 mg/dL	55	44.4	57	52.8	0.200
Cholesterol LDL ≥ 130 mg/dL	27	22.1	27	25.5	0.554
Triglycerides ≥ 150 mg/dL	50	40.0	41	37.3	0.668

[*]Estimated by chi-square test; [a]Classification according to Kidney Disease Outcomes Quality Initiative; P = Statistical significance; [b]Patients that smoked more than 100 cigarettes in any time of life and actually smoke; [c]Regular use of alcohol.

Figures

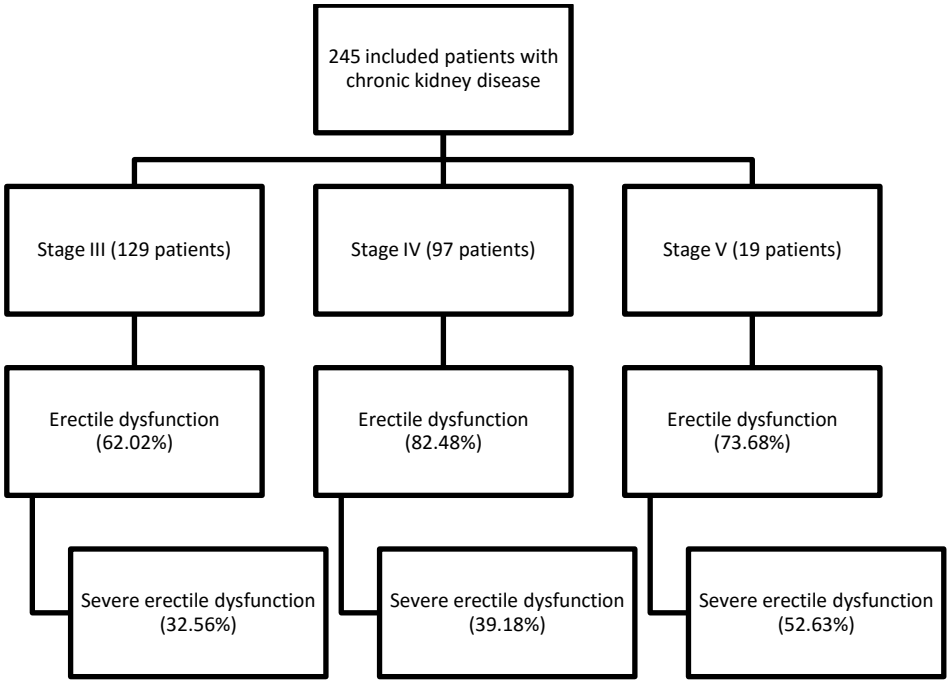

Figure 1- Erectile dysfunction and the proportion of severe degree in each stage.

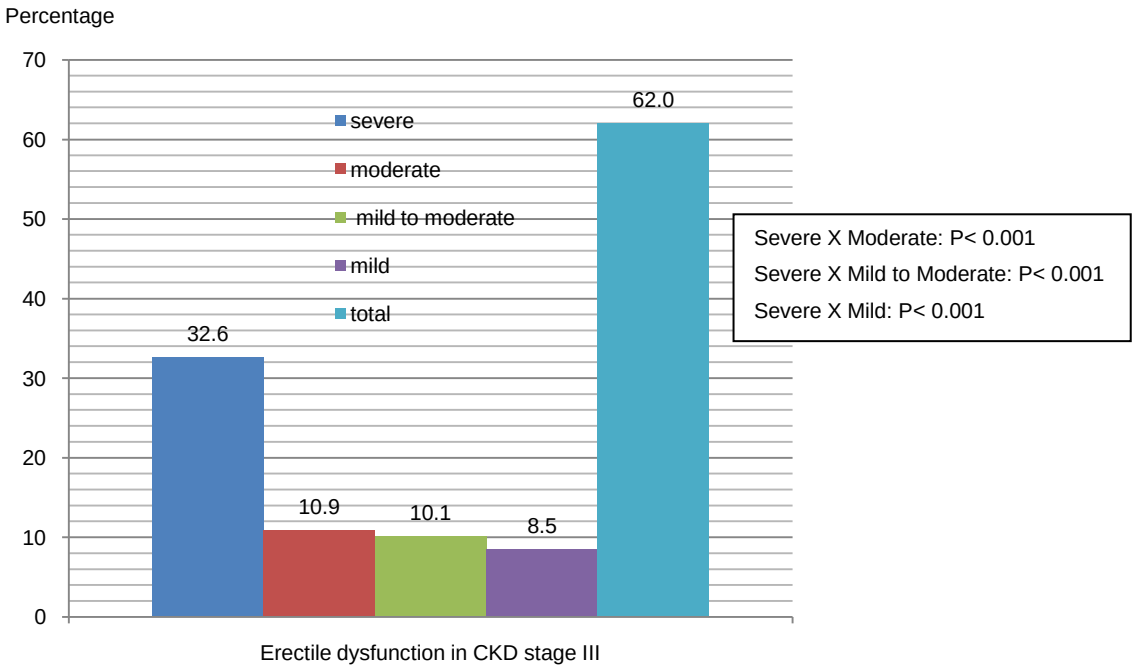

Figure 2- Comparison of severe versus moderate, mild to moderate and mild erectile dysfunction in patients with CKD on conservative treatment in stage III. Estimated by chi-square test; P = Statistical significance; CKD = Chronic Kidney Disease.

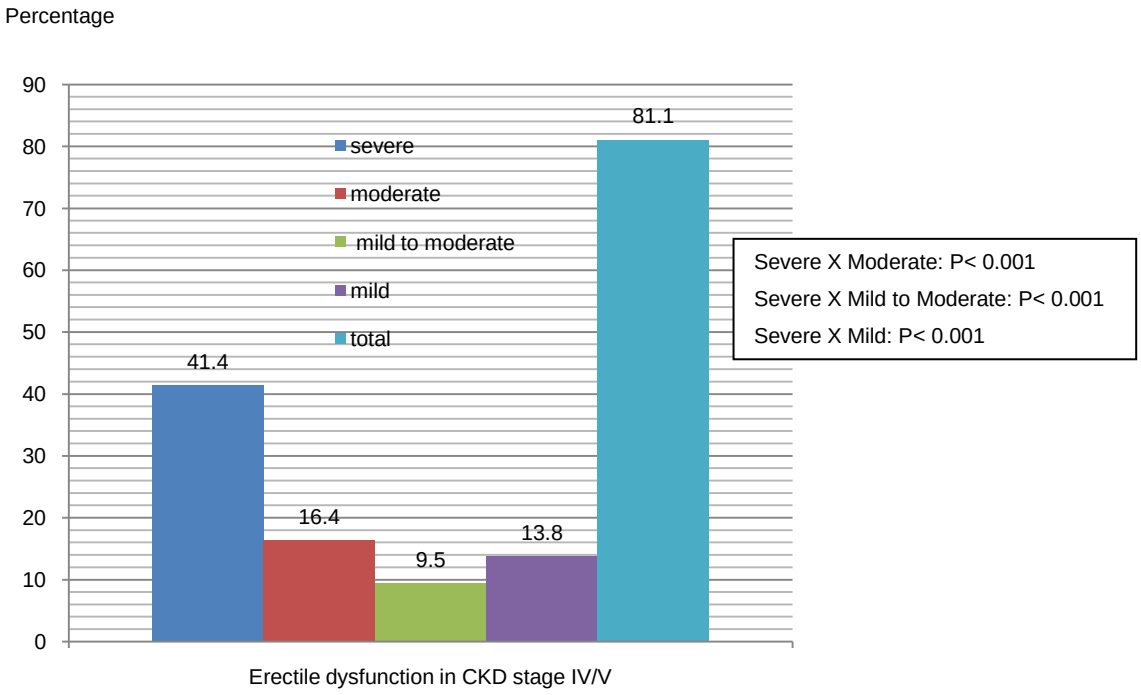

Figure 3 - Comparison of severe versus moderate, mild to moderate and mild erectile dysfunction in patients with CKD on conservative treatment in stage IV/V. Estimated by chi-square test; P = Statistical significance; CKD = Chronic Kidney Disease.

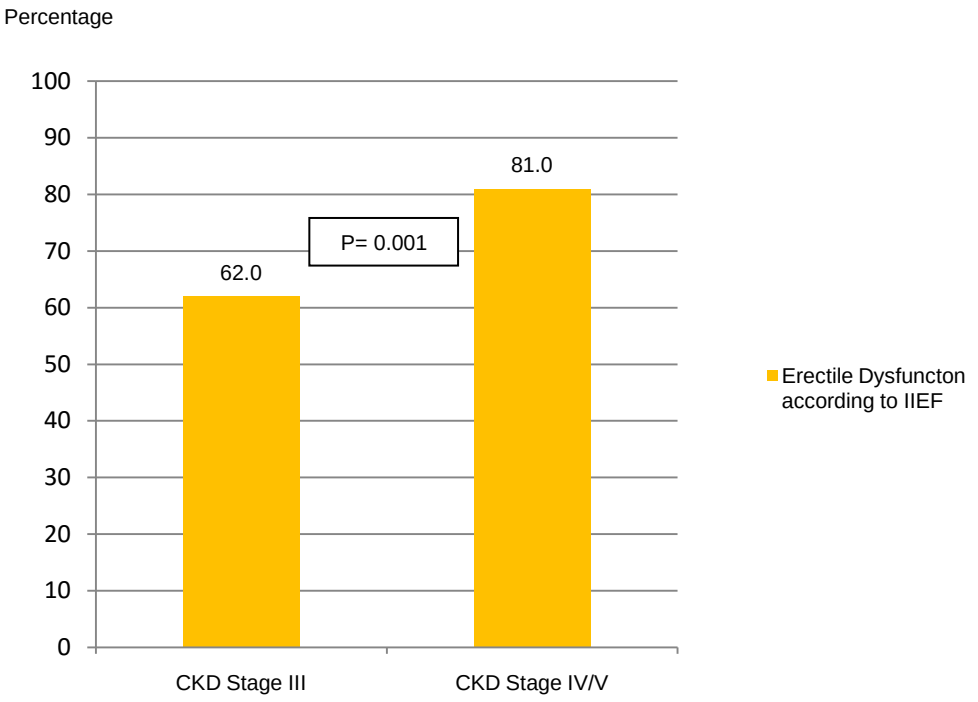

Figure 4- Comparison of erectile dysfunction among patients with chronic kidney disease on conservative treatment in stage III versus IV/V, estimated by chi-square test; P = Statistical significance; CKD = Chronic Kidney Disease; IIEF = International index of erectile function.

Percentage

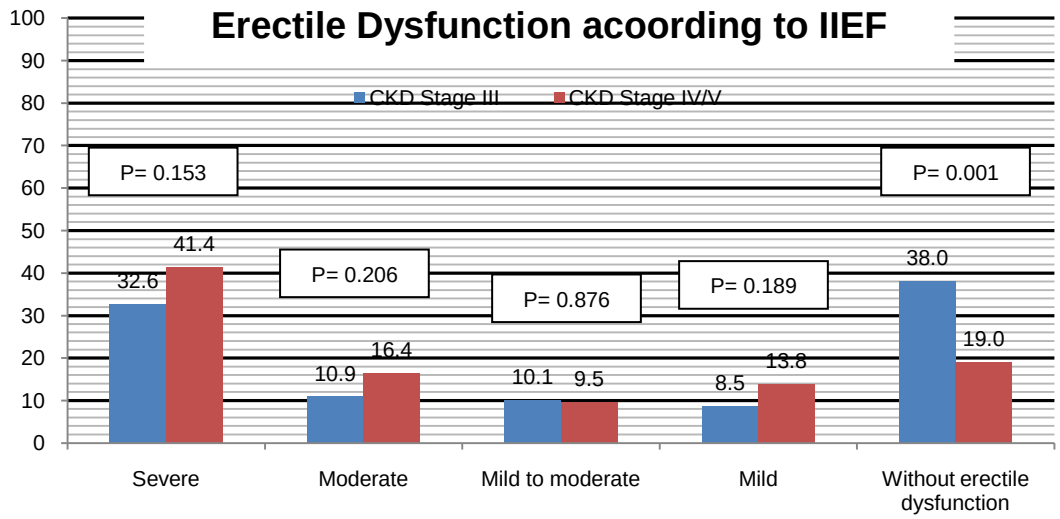

Figure 5- Comparison of category of erectile dysfunction among patients with chronic kidney disease on conservative treatment in stage III versus IV/V, estimated by chi-square test; P = Statistical significance; CKD = Chronic Kidney Disease; IIEF = International index of erectile function.

6CONSIDERAÇÕES FINAIS

6.1 Conclusões

- A disfunção erétil é encontrada na maior parte dos pacientes portadores de doença renal crônica em tratamento conservador (71,02%);
- A disfunção erétil grave ocorre com maior frequência do que a disfunção erétil moderada, leve a moderada ou leve entre os portadores de doença renal crônica em tratamento conservador;
- A idade maior que 50 anos, índice de massa corpórea menor que 25, *diabetes mellitus*, estágios IV/V de doença renal crônica, arritmias e distúrbios da condução cardíacos, hiperplasia benigna da próstata, uso atual ou prévio de cigarro, tempo de tabagismo maior ou igual a10 anos, índice de maço-ano de cigarros maior ou igual a 20, tempo do uso de álcool maior ou igual a 10 anos, albumina menor que 3,5 g/100 mL e níveis de *clearance* da creatinina entre 15 e 29 mL/mim/1,73 m^2 foram associados à disfunção erétil em portadores de doença renal crônica em tratamento conservador;
- A *diabetes mellitus* foi a única variável que se associou à disfunção erétil em pacientes portadores de doença renal crônica em tratamento conservador, independente da influência de outros fatores que foram estudados conjuntamente;
- A prevalência de disfunção erétil aumenta em portadores de doença renal crônica em tratamento conservador com a progressão da doença renal.

6.2 Limitações do estudo

O estudo apresenta limitações. Restrições do IIEF (instrumento de medida de DE usado) e falhas na execução e desenho do trabalho podem ter interferido nos resultados apresentados. O IIEF, na sua concepção, não foi desenvolvido para avaliar subpopulações específicas, como a de portadores de DRC. A avaliação da função erétil por meio desse instrumento é fugaz, referindo-se à atividade sexual apenas nas quatro últimas semanas que antecedem a aplicação do questionário. Deste modo, problemas sexuais momentâneos podem ter rotulado pacientes com função erétil normal como portadores de DE. Os pacientes que não tentaram ou não realizaram atividade sexual nas quatro semanas anteriores à aplicação do questionário

receberam pontuações mínimas e foram classificados como portadores de DE. Esses pacientes poderiam ter função erétil normal e não tiveram atividade sexual por diferentes razões (crença religiosa, ausência de parceira sexual, brigas conjugais etc.). A avaliação da função erétil com as seis questões do IIEF referentes ao assunto é superficial. Não é possível, em poucas perguntas padronizadas, estabelecer um diagnóstico definitivo de DE. Na verdade, diagnósticos de distúrbios sexuais envolvem fatores clínicos, sociais, educacionais, ambientais e psicológicos que tornam necessárias avaliações aprofundadas com, no mínimo, história clínica detalhada.

No que diz respeito a falhas na execução e no desenho do trabalho é possível citar alguns pontos que podem ter interferido nos resultados apresentados. O estudo é transversal e não permite estabelecer relação de causalidade entre as variáveis, apenas de associação. Assim, todas as variáveis que foram associadas à DE, neste trabalho, não podem automaticamente ser consideradas causadoras desta disfunção sexual. A pesquisa não analisou muitas variáveis que já foram associadas à DE (problemas econômicos, psicológicos e conjugais, ansiedade, depressão, doenças vasculares periféricas, neuropatias autonômicas, função renal residual, prolactina, hormônio folículo estimulante, testosterona, hormônios tireoidianos, zinco sanguíneo etc.). As questões do IIEF foram as únicas medidas de função erétil aplicadas; outros testes diagnósticos ou laboratoriais confirmatórios não foram aplicados. Por fim, as respostas ao IIEF podem ter sido preenchidas incorretamente, subestimando a DE. Pacientes portadores de distúrbios sexuais com preconceitos e temerosos de exposição de dados pessoais podem ter respondido o questionário de forma a supervalorizar sua *performance* sexual.

6.3 Pontos positivos da pesquisa

A pesquisa apresenta alguns pontos relevantes. A avaliação da prevalência e de fatores associados à DE em pacientes com DRCTC é tema escasso na literatura. De acordo com a literatura pesquisada, entre os trabalhos que avaliaram os fatores associados à DE em pacientes portadores de DRCTC, este é o que tem a maior amostra apresentada até o momento. Uma busca no banco de dados *Pubmed* e Portal Capes, cruzando *MeSH terms* e os descritores *chronic renal insufficiency*, *chronic kidney disease*, *end stage kidney disease*, *erectile function, erectile dysfunction, impotence, sexual disturb, sexual disorder*, *sexual dysfunction e sexual function*,

identificou apenas um estudo com o objetivo de avaliar fatores associados à DE, exclusivamente em pacientes com DRCTC, com amostra cerca de três vezes menor do que a pesquisa atual (MESQUITA *et al*., 2012). A presente pesquisa utilizou o IIEF que, apesar das suas limitações, é a ferramenta considerada "padrão ouro" para avaliar DE. O instrumento é sólido, sensível, específico, confiável e validado psicometricamente em vários idiomas e, portanto, é seguro, permitindo reprodutibilidade e comparações com outros estudos (QUINTA; NOBRE, 2012; ROSEN *et al*., 1997; ROSEN; CAPPELLERI; GENDRANO, 2002).

6.4 Aplicações, recomendações, implicações e especulações

O atual estudo revelou uma alta prevalência de DE em pacientes portadores de DRCTC e enumerou os fatores associados a esse distúrbio sexual nesta população. Diante destas informações, os profissionais de saúde dispõem de dados que os compelem a investigar rotineiramente a presença da DE entre esses pacientes, especialmente naqueles que apresentam os fatores associados descritos previamente. A investigação permitiria detecção e tratamento de um maior número de portadores de DE, o que traria benefícios à qualidade de vida dos portadores de DRCTC.

A presente pesquisa revelou uma maior prevalência de DE em portadores de DRC avançada (estágios IV/V) em tratamento conservador em relação aos pacientes em estágio III. Esta informação permite supor que a progressão da DRC nos pacientes em tratamento conservador prejudica a função erétil. A hipótese pode ser confirmada e ganhar solidez com estudos prospectivos que avaliem a DE em fases precoces e tardias da DRC.

Por fim, considerando todos os aspectos da pesquisa, é possível dizer que este trabalho é um ponto de partida importante para reavaliar o peso de vários fatores que podem influenciar na função erétil de pacientes portadores de DRCTC; sem dúvida, trata-se de um estudo que ajuda a criar e a sedimentar novos e antigos conceitos sobre DE nesta população.

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ANEXOS

Anexo 1 – Parecer do Comitê de Ética

HC Hospital das Clínicas UFG

MINISTÉRIO DA EDUCAÇÃO
UNIVERSIDADE FEDERAL DE GOIÁS
HOSPITAL DAS CLÍNICAS
Comitê de Ética em Pesquisa

UFG 50 ANOS – CONHECIMENTO SEMPRE PRESENTE

PROTOCOLO CEP/HC/UFG Nº 090/2011 **Goiânia, 11/08/2011**

PESQUISADOR RESPONSÁVEL: *Dr. Márcio Rodrigues Costa*
ORIENTADOR: *Dr. Ênio Chaves de Oliveira*
CO-ORIENTADORA: *Drª. Viviane Campos Ponciano*

TÍTULO- *"Estudo da prevalência de disfunção erétil em pacientes em hemodiálise e em portadores de insuficiência renal crônica não dialítica em Goiânia".*

Área Temática: *Grupo III*
Instituição Proponente: *Hospital das Clinicas/UFG*
Local de realização: *Ambulatório de Nefrologia e Samis HC/UFG; CENTREL- Centro de Nefrologia e Transplante Renal; Clinicas de Doenças Renais; Hospital Geral de Goiânia (HGG); NEFRON- Clinica do Rim e Hemodiálise;*

Informamos que o Comitê de Ética em Pesquisa **analisou** e **aprovou** o projeto de pesquisa acima referido, juntamente com os documentos apresentados e o mesmo foi considerado em acordo com os princípios éticos vigentes.

Informamos que **não há** necessidade de aguardar o parecer da CONEP- Comissão Nacional de Ética em Pesquisa para iniciar a pesquisa.

O pesquisador responsável deverá encaminhar ao CEP/HC/UFG, relatórios semestrais do andamento da pesquisa, encerramento, conclusão (ões) e publicação (ões). O relatório devera ser entregue em CD devidamente assinado.

O CEP/HC/UFG pode, a qualquer momento, fazer escolha aleatória de estudo em desenvolvimento para avaliação e verificação do cumprimento das normas da Resolução 196/96 (*Manual Operacional Para Comitês de Ética em Pesquisa – Item 13*).

Farm. José Mário Coelho Moraes
Coordenador do CEP/HC/UFG

1ª AVENIDA, S/Nº, SETOR LESTE UNIVERSITÁRIO - CEP: 74 605-050 - FONE: 3269 8338 - FAX: 3269 8426
GOIÂNIA - GOIÁS

Anexo 2 – Índice Internacional de Função Erétil (IIEF) (Domínio da Função Erétil)

Coordenador: _____
Data da visita, período do dia e dia da semana:_____

Pontuação das alternativas nas questões 1, 2, 3, 4 e 5: 0 na primeira, 1 na segunda, 2 na terceira, 3 na quarta, 4 na quinta e 5 na sexta alternativa.
Pontuação das alternativas na questão 6: 1 na primeira, 2 na segunda, 3 na terceira, 4 na quarta e 5 na quinta.
Instruções: Estas questões são referentes à sua **ereção e aos possíveis** problemas que a mesma poderia ter trazido na sua vida sexual, nas últimas 4 semanas. Por favor, responda às seguintes perguntas da forma mais honesta e clara possível. Para responder a essas questões, entende-se por:
A atividade sexual inclui relações sexuais, carícias, preliminares e masturbação.
A relação sexual é definida como a penetração vaginal
Estímulo sexual inclui situações como preliminares com um (a) parceiro (a), olhar fotos eróticas, etc.
Ejacular é definido como a expulsão do sêmen do pênis (ou sensação do mesmo)

Marcar apenas um círculo por pergunta:
1. Durante as últimas 4 semanas, com que freqüência você foi capaz de conseguir uma **ereção** durante a atividade sexual?
0 Sem atividade sexual
0 Quase nunca ou nunca
0 Poucas vezes (muito menos da metade das vezes)
0 Às vezes (cerca de metade do tempo)
0 A maioria das vezes (muito mais que a metade das vezes)
0 Quase sempre ou sempre

2. Ao longo das últimas 4 semanas, quando você teve **ereções** com estimulação sexual, com que freqüência essas **ereções** foram fortes o suficiente para a penetração?
0 Sem atividade sexual
0 Quase nunca ou nunca
0 Poucas vezes (muito menos da metade das vezes)
0 Às vezes (cerca de metade do tempo)
0 A maioria das vezes (muito mais que a metade das vezes)
0 Quase sempre ou sempre

3. Durante as últimas 4 semanas, quando tentou manter relação sexual, com que freqüência você foi capaz de penetrar (entrar) no seu parceiro (a)?
0 Não tentou manter relações sexuais
0 Quase nunca ou nunca
0 Poucas vezes (muito menos da metade das vezes)
0 Às vezes (cerca de metade das vezes)
0 A maioria das vezes (muito mais que a metade das vezes)
0 Quase sempre ou sempre

4. Ao longo das últimas 4 semanas, durante as relações sexuais, quantas vezes você foi capaz de manter a sua **ereção** depois que você tinha penetrado (entrado) em seu (sua) parceiro (a)?
0 Não tentou manter relações sexuais
0 Quase nunca ou nunca
0 Poucas vezes (muito menos da metade das vezes)
0 Às vezes (cerca de metade das vezes)
0 A maioria das vezes (muito mais que a metade das vezes)
0 Quase sempre ou sempre

5. Ao longo das últimas 4 semanas, durante as relações sexuais, o quanto era difícil manter a **ereção** até a conclusão da relação sexual?
0 Não tentou manter relações sexuais
0 Extremamente difícil
0 Muito difícil
0 Difícil
0 Pouco difícil
0 Sem dificuldade

15. Durante as últimas 4 semanas, como você classificaria sua confiança em obter e manter a sua **ereção**?
0 Muito baixo
0 Baixo
0 Moderado
0 Alta
0 Muito alto

Anexo 3 – Norma de publicação do periódico "*International Journal of Impotence Research: The Journal of Sexual Medicine*"

Guide to Authors

Welcome to the electronic manuscript submission website for *International Journal of Impotence Research*. The instructions below are structured so you can quickly and easily answer the following questions:

1. Is my manuscript suitable for *International Journal of Impotence Research*? (Scope + Editorial Note)
2. How do I format my manuscript for *International Journal of Impotence Research*? (Format of Papers)
3. How do I submit my manuscript to *International Journal of Impotence Research*? (Submission of Papers)

ABOUT THE JOURNAL

Scope

International Journal of Impotence Research publishes original, novel, peer-reviewed reports that pertain to sexual medicine; confirmatory reports of previously described phenomena that either contain a novel finding or are of such magnitude to enhance the field; as well as laboratory or basic science investigational studies that are meritorious. All scientific aspects of male and female sexual dysfunction are welcome.

Topics Covered questionnaires or scales that measure male or female sexual dysfunction, epidemiologic studies, male hypogonadism, female androgen deficiency, organic and psychogenic male erectile dysfunction, vasculogenic erectile dysfunction, female arousal disorders, rapid and delayed ejaculation, orgasmic dysfunction, penile vascular reconstructive surgery, depression and associated disorders as they relate to male sexual dysfunction, Lower Urinary Tract symptoms, female vascular disorders as they pertain to sexual dysfunction. Studies assessing therapies such as oral therapies, topical therapies, vacuum devices, penile prosthesis, intracavernosal injection are of interest. The effect of CNS or peripheral neurologic disease or spinal cord injury on sexual dysfunction will be entertained. Reports delving into the mechanisms of disease are highly desired. Human and non-human studies are welcome.

Editor	Nestor F. Gonzalez-Cadavid, PhD
Frequency	6 issues a year
Abstracted in	Index Medicus/MEDLINE Elsevier BIOBASE/Current Awareness in Biological Sciences Current Opinion in Urology Excerpta Medica/EMBASE Current Contents/Clinical Medicine Research Alert SciSearch Science Citation Index UK Health Centre Index

Editorial Note
Successful manuscripts will be hypothesis-driven. The hypothesis must be clearly stated at the outset and the manuscript should be geared toward verification of the hypothesis. Priority will be given to those clinical studies that exemplify the highest level of scientific practice, based upon the evidence-based medicine grading scheme. Novel laboratory investigation will receive high priority as well.

FORMAT OF PAPERS

Article Types Table

Article Type	Description	Approx Word Count
Original Article	Are scientific reports from original clinical research in sexual medicine and should follow the structure outlined below	The text is limited to 3000 words (including abstract text), a maximum of 7 tables and figures (total), and up to 50 references.
Review	Are usually solicited by the editors. All review articles undergo the same peer-review and editorial process as all other manuscripts submitted to *IJIR*	
Letters to the Editor	Are considered for publication (subject to editing and abridgment) provided they do not contain material that has been submitted or published elsewhere. It must not be signed by any more than three authors and letters referring to a recent IJIR article must be received within six weeks of its publication.	The text, not including references, must not exceed 500 words, with no more than five references and one figure or table.
Editorials	Provide commentary on and analysis of an article in the particular issue of IJIR. They are always solicited.	Editorials are limited to 750 words, with up to 5 references.

PLEASE NOTE: Authors submitting a revised manuscript after review must include two versions: (1) a marked up manuscript that highlights changes made in response to the reviewers' comments and (2) a 'clean' (non-highlighted) manuscript.

Preparation of Original Articles

1. Cover letter (must include a Conflict of Interest statement)
2. Title page (excluding acknowledgements)
3. Abstract
4. Introduction
5. Materials (or patients) and methods
6. Results
7. Discussion
8. Acknowledgements
9. Conflict of Interest
10. References

11. Tables
12. Figures

Cover letter
The uploaded covering letter must state the material is original research, has not been previously published and has not been submitted for publication elsewhere while under consideration. The covering letter must also contain a Conflict of Interest statement (see Editorial Policy section).

Title page
The title page should bear the title of the paper, the full names of all the authors, highest academic degree obtained, and their affiliations, together with the name, full postal address, telephone and fax numbers and e-mail address of the author to whom correspondence and offprint requests are to be sent (This information is also asked for on the electronic submission form). The title should be brief, informative, of 150 characters or less and should not make a statement or conclusion. The running title should consist of not more than 50 letters and spaces. It should be as brief as possible, convey the essential message of the paper and contain no abbreviations. Authors should disclose the sources of any support for the work, received in the form of grants and/or equipment and drugs.

Abstract
The abstract should not exceed 200 words.

Introduction
The Introduction should assume that the reader is knowledgeable in the field and should therefore be as brief as possible but can include a short historical review where desirable.

Materials / subjects and Methods
This section should contain sufficient detail, so that all experimental procedures can be reproduced, and include references. Methods, however, that have been published in detail elsewhere should not be described in detail. Authors should provide the name of the manufacturer and their location for any specifically named medical equipment and instruments, and all drugs should be identified by their pharmaceutical names, and by their trade name if relevant.

Results and Discussion
The Results section should briefly present the experimental data in text, tables or figures. Tables and figures should not be described extensively in the text, either. The discussion should focus on the interpretation and the significance of the findings with concise objective comments that describe their relation to other work in the area. It should not repeat information in the results. The final paragraph should highlight the main conclusion(s), and provide some indication of the direction future research should take.

Acknowledgements
These should be brief, and should include sources of support including sponsorship (e.g. university, charity, commercial organization) and sources of material (e.g. novel drugs) not available commercially.

Conflict of interest
Authors must declare whether or not there is any competing financial interests in relation to the work described. This information must be included at this stage and will be published as part of the paper. Conflict of interest should also be noted on the cover letter and as part of the submission process. See the Conflict of Interest documentation in the Editorial Policy section for detailed information.

References
Only papers directly related to the article should be cited. Exhaustive lists should be avoided. References should follow the Vancouver format. In the text they should appear as numbers starting at one and at the end of the paper they should be listed (double-spaced) in numerical order corresponding to the order of citation in the text. All authors should be quoted for papers with up to six authors; for papers with more than six authors, the first six only should be quoted, followed by *et al*. Abbreviations for titles of medical periodicals should conform to those used in the latest edition of *Index Medicus*. The first and last page numbers for each reference should be provided. Abstracts and letters must be identified as such. Papers in press and papers already submitted for publication may be included in the list of references but no citation is required for work that is not yet submitted for publication.
Journal article, up to six authors: Abber JC, Lue TF, Orvis BR, McClure RD. Diagnostic test for impotence a comparison of papaverine injections with penile-brachial index and nocturnal penile tumescence. *J Urol*1986; **135**: 923–925.
Journal article, e-pub ahead of print: Campos AR, Cunha KMA, Santos FA, Silveira ER, Uchoa DEA, Nascimento NRF et al. Relaxant effects of an alkaloid-rich fraction from *Aspidosperma ulei* root bark. *Int J Impot Res* 2007; e-pub ahead of print 29 November 2007; doi:10.1038/sj.ijir.3901624.
Journal article, in press: Chubak B. Impotence and suing for sex in eighteenth-century England. *Urology* (in press).
Complete book: Kaplan HS. *The New Sex Therapy: Active Treatment of Sexual Dysfunctions*, 2nd edn. Brunner/Mazel: New York, 1979.
Chapter in book: Batra SK, Lardner TJ. Sperm transport in the vas deferens. In: Hafez ESE, ed. *Human Semen and Fertility Regulation in Men*. CV Mosby: St Louis, MO, 1976, pp 100–106.
Abstract: Syrjala KL, Abrams JR, Storer B, Heiman JR. Prospective risk factors for five-year sexuality late effects in men and women after haematopoietic cell transplantation. *Bone Marrow Transplant* 2006; **37**(Suppl 1): S4 (abstract 107).
Correspondence: Thomas J Jr. Erectile dysfunction in patients with chronic renal failure [letter]. J Sex Med 1999; **12**: 123–456.
EndNote users should select the *International Journal of Impotence Research* output style for the correct reference style.
Personal communications must be allocated a number and included in the list of references in the usual way or simply referred to in the text; the authors may choose which method to use. In either case authors must obtain permission from the individual concerned to quote his/her unpublished work.

Tables
These should be labelled sequentially and cited within the text. Each table should be presented on its own page, numbered and titled. Reference to table footnotes should be made by means of Arabic numerals. Tables should not duplicate the content of the text. They should consist of at least two columns; columns should always have headings.

Authors should ensure that the data in the tables are consistent with those cited in the relevant places in the text, totals add up correctly, and percentages have been calculated correctly. Unlike figures or images, tables may be embedded into the word processing software if necessary, or supplied as separate electronic files.

Figures

Figures and images should be labelled sequentially, numbered and cited in the text. Figure legends should be brief, specific and appear on a separate manuscript page after the References section. Refer to (and cite) figures specifically in the text of the paper. Figures should not be embedded within the text. If a table or figure has been published before, the authors must obtain written permission to reproduce the material in both print and electronic formats from the copyright owner and submit it with the manuscript. This follows for quotes, illustrations and other materials taken from previously published works not in the public domain. The original source should be cited in the figure caption or table footnote. The use of three-dimensional histograms is strongly discouraged when the addition of the third dimension gives no extra information. Scale markers should be used in the image for electron micrographs, and indicate the type of stain used. Detailed guidelines for submitting artwork can be found by downloading the Artwork Guidelines PDF.

Supplementary information

Supplementary information (SI) is peer-reviewed material directly relevant to the conclusion of an article that cannot be included in the printed version owing to space or format constraints. The article must be complete and self-explanatory without the SI, which is posted on the journal's website and linked to the article. SI may consist of data files, graphics, movies or extensive tables, view the Artwork Guidelines PDF for more information on accepted file types. Authors should submit documents in their FINAL format as they are not edited, typeset or changed, and will appear online exactly as submitted. When submitting SI authors are required to:

- Include a text summary (no more than 50 words) to describe the contents of each file.
- Identify the types of files (file formats) submitted.
- Include the text ‘Supplementary information is available at (the journal’s name) ’s website’ at the end of the article and before the references.

House Style

General

- Do not make rules thinner than 1pt (0.36mm)
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- Colour should be distinct when being used as an identifying tool
- Spaces, not commas should be used to separate thousands
- Abbreviations should be preceded by the words they stand for in the first instance of use
- Use SI units throughout
- Text should be double spaced with a wide margin
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Availability of data and materials

An inherent principle of publication is that others should be able to replicate and build upon the authors' published claims. Therefore, a condition of publication is that authors are

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Sequences, structures and 'omics': Papers reporting protein or DNA sequences and molecular structures will not be accepted without an accession number to Genbank/EMBL/DDBJ, Protein DataBank, SWISS-PROT or other appropriate, identified, publicly available database in general use in the field that gives free access to researchers from the date of publication.

Authors of papers describing structures of biological macromolecules must provide experimental data upon the request of editors if they are not already freely accessible in a publicly available database such as Protein DataBank, Nucleic Acids Database or Biological Magnetic Resonance Databank. Five separate copies of these data should be provided to the editors in an appropriate format (for example, CD or DVD) for the purposes of peer-review.

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For human studies, International Journal of Impotence Research requires a statement confirming the Declaration of Helsinki protocols were followed and that patients gave their written, informed consent.

Gene Nomenclature

Authors should use approved nomenclature for gene symbols, and use symbols rather than italicized full names (Ttn, not titin). Please consult the appropriate nomenclature databases for correct gene names and symbols. Approved human gene symbols are provided by HUGO Gene Nomenclature Committee (HGNC), e-mail: nome@galton.ucl.ac.uk; see also http://www.gene.ucl.ac.uk/nomenclature. Approved mouse symbols are provided by The Jackson Laboratory, e-mail: nomen@informatics.jax.org; see also http://www.informatics.jax.org/mgihome/nomen. For proposed gene names that are not already approved, please submit the gene symbols to the appropriate nomenclature committees as soon as possible, as these must be deposited and approved before publication of an article. Avoid listing multiple names of genes (or proteins) separated by a slash, as in '*Oct4/Pou5f1'*, as this is ambiguous (it could mean a ratio, a complex, alternative names or different subunits). Use one name throughout and include the other at first mention: '*Oct4*(also known as *Pou5f1*)'.

Clinical Trials Registration

The *International Journal of Impotence Research* subscribes to the standards set by the International Committee of Medical Journal Editors in *The Lancet* (**364**:911-912, 2004), requiring that all trials that start enrolling participants after July 1, 2005 must be registered in a suitable publicly accessible register before that date in order to be considered for publication. Those trials that started enrollment before July 1, 2005 must have registered before September 13, 2005 to be considered for publication. Suggested registers include http://www.clinicaltrials.gov and http://www.controlled-trials.com. Registration in the former is free, while registration for trials that do not emanate from developing countries carries a $144 charge in the latter. Access to both registries is free.

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First, if you have not done so already, register for an account. After this, please follow the instructions below to submit your article through our secure server.

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When you first access our tracking system, you will be taken to your Home page, where different categories of tasks are listed. If you are required to perform a pending action item or task, there will be a red arrow ➔ next to a 'Manuscript' link. Throughout the system, red arrows ➔ reflect pending action items which you should address. If there are no red arrows visible on your Home page, then you are finished and have no outstanding tasks to complete. At any time please press HOME to go to the submission home page.

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- Institution
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- (Work Telephone Numbers)
- Fax Numbers

In addition you will need:

- Covering letter (including Conflict of Interest statement)
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- Manuscript files in Word, WordPerfect, text or any RTF format
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- Tables in Excel (preferred) as separate files or embedded at the end of the manuscript file

The manuscript submission process is broken down into a series of 4 primary tasks that gather detailed information about your manuscript and allow you to upload the pertinent text and figure/image files. The sequence of screens is as follows:

1. The 'Files' primary task allows you to select the actual file locations (via an open file dialogue). You will be able to 'Browse' for the relevant files on your computer. **Please include the figure number in the title line for each figure.** On the completion screen, you will be asked to specify the order in which you want the individual files to appear in the merged document. Editors and/or reviewers will also be able to look at the individual PDF files if necessary. For more information on accepted file types, view the Artwork Guidelines PDF.
2. The 'Manuscript Information' primary task which asks for author details, the manuscript title, abstract, other associated manuscript information and types/number of files to be submitted. Please note, if you are the corresponding author please submit your details in the corresponding author fields; DO NOT re-enter the same details in the contributing author fields.

3. The 'Validate' primary task gives you the opportunity to check and verify the manuscript files and manuscript information uploaded. If you are submitting manuscript files separately, we create a merged PDF containing your manuscript text, figures and tables to simplify the handling of your paper. You will need to approve the merged PDF file, and a PDF or any other file not included in the merge, to submit your manuscript. You may also update and/or change manuscript files and manuscript information by clicking on the 'Change' or 'Fix' links respectively.
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It is essential that you note whether or not there is any conflict of interest in the submission form. This does not act as a substitute for the information that must be provided in the manuscript. See the Conflict of Interest documentation in the Editorial Policy section for detailed information.

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For more information on submitting figure files and tables, please refer to the artwork guidelines PDF.

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Microsoft Office 2007 saves files in an XML format by default (file extensions .docx, .pptx and xlsx). Files saved in this format cannot be accepted for publication. Save Word documents using the file extension .doc

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These instructions also apply for the new versions of Excel and PowerPoint.

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- In the drop-down menu - select "Equation Editor 3.0"

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Dr Caron's work has been funded by the NIH. He has received compensation as a member of the scientific advisory board of Acadia Pharmaceutical and owns stock in the company. He also has consulted for Lundbeck and received compensation. Dr Rothman and Dr Jensen declare no potential conflict of interest.

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* Tables (if applicable)

Letters to the Editor
Letters to the Editor are considered for publication (subject to editing and abridgment), provided they do not contain material that has been submitted or published elsewhere. They do not contain an abstract or keywords, and the text need not be divided into sections. In all other respects, the directions for original articles should be followed.
The text, excluding References, Tables, Figures or Legends must not exceed 1000 words. No more than 10 references and either one Table or one Figure are allowed.
AJA considers three types of Letters to the Editor.
Case study letters, in which case studies from the clinic can be submitted.
Original research letters, in which reports of interesting preliminary or pilot study findings that do not fulfill the criteria for full research papers (e.g. short experimental reports limited by sample size or duration, novel hypotheses or commentaries) may be submitted.

Experimental details are not required, but a general outline of experimental methods and results should be included.
Letters with Commentaries and Opinions, in which unsolicited opinions and commentaries on papers published in other journals, perspectives and opinions on Andrological care of unusual urgency, significance and interest, whose topics may be useful and informative to the scientific community, can be submitted.

Manuscript File Formats
For submission, acceptable manuscript file formats include Word, WordPerfect, EPS, Text, Postscript and RTF formats.
Use 12-point font size, double- or 1.5-line spacing, and leave the right-hand margins unjustified with margins of at least 2.5 cm.
Each page should be numbered in the upper right corner and each line should be numbered continuously.
Make spelling consistent with current editions of either Webster's Dictionary (Am. Eng.) or Oxford English Dictionary (Br. Eng.).

Article sections
In general, manuscripts should be divided in to the following sections.

Title page
The title page should give a concise but informative title, the first and last names and other initials of all authors, as well as their affiliations (but not degrees).
The orders in which the contributors are listed should be agreed amongst the investigators, and should indicate that the first listed made the greatest contribution to the paper.
Full contact details should be provided for the corresponding author.
There should no more than nine co-authors without approval by the Editor.
Provide a running title of no more than 50 characters, including spaces.

Abstract and keywords
The abstract should be an unstructured narrative paragraph of no more than 250 words. It should be comprehensible to readers without their having read the paper, and abbreviations and reference citations within the abstract should be avoided. It should outline the purpose of the study, the basic procedures and the most important conclusions.
Three to ten keywords, which may appear in the title, should be given in alphabetical order below the abstract, each separated by a comma. Whenever possible, the terms should be from the Medical Subject Headings list of Index Medicus2.

Take Home Message
This text will appear only in the online-contents page, and should stimulate the reader to read the full text of the article. Two or three sentences (of no more than 40 words) summarizing the main message expressed in the article must be uploaded as a separate file.

Introduction
This should give a short, clear account of the background and reasons for undertaking the study by reference only to the pertinent literature. It should not be a review of all literature in the field but be limited to analysis of those aspects of previous work that raise questions that can be answered by the hypothesis addressed in the work being reported.
Do not repeat the Discussion here.

Materials and methods
This section should contain sufficient detail so that all experimental procedures can be repeated by others in conjunction with cited references. It may be divided into subheadings.

Experimental studies
The sex, age, and body weights of tested animals or humans should be expressed as mean and standard deviation, or median and quartiles (if skewed), with the range of values.

Human studies
Manuscripts should contain a statement to the effect that all human studies have been reviewed by a named institutional Ethics committee with relevant jurisdiction and that all participants had given, usually written, informed consent before their inclusion in the study.
Clinical trials should be registered and the registration number should be stated. Details that might disclose the identity of the subjects under study should be omitted. Authors should also confirm that their work complies with the Code of Ethics of the World Medical Association (Declaration of Helsinki 1964, revised 20033 and Declaration of Tokyo 1975, revised 20064).

Animal studies
Scientific species nomenclature should be used at all times, providing the genus, species (in italics) and strain, together with the authority, for all micro-organisms, plants and non-human animals. Authors should indicate that experiments on animals were conducted within their national animal welfare guidelines and state what institutional animal ethics approval was granted or covered the experimental work described.

Procedures and Methodology
Novel experimental procedures should be described in detail, but where possible published procedures should be cited with any published modifications.

Centrifugation
Values in rpm are acceptable for slow rotation used for mixing, but should be converted to relative centrifugal force (RCF: unit, gravity g) for rapid rotation used for centrifugation. RCF depends on the speed of rotation (N, rpm) and the distance from the centre of the rotor to the point at which the force is to be measured (radius, R, cm). RCF = 1.118 × 10-5 × R × N2 . (1 inch = 2.54 cm).

Chemicals and equipment
Names of products and manufacturers should be included giving both the model, version or catalogue number, company name, city and country, sufficient for future identification of specific items used.
Generic names of drugs should be used. The brand, trade or commercial name of a drug may be included in parentheses upon first mention.
Chemical abbreviations should be defined on their first appearance in the text.
The source of material not available commercially (e.g. gifts) should be mentioned here or in the Acknowledgements.

Concentration and dilution
Concentration of solutes is expressed moles per L of solution (molarity), moles per kg solvent (molality) or percentages of solids, liquids and gases (state % as w/v or v/v). Concentrations of macromolecules may be given as g/L or % (w/v).
Dilutions of solids or liquids in liquids are expressed as 1:1, 1-to-1, 1+1 or 1-in-2.
Note that increasing a solute concentration, decreases its dilution, and that increasing a solute dilution, decreases its concentration.
Note that a 1:4 (1-to-4) dilution is not the same as a 1/4 (1-in-4) dilution. A 1:1 dilution or (1-to-1) involves adding one part to one part (1+1), giving a total of 2 parts and a proportion of 1/2 or (1-in-2).

Concentration, dose and dosage
Concentration is an amount of substance per unit volume, dose is an amount of substance given at one time, and dosage is an amount of substance given over a stated period.
For a drug at 500 mg/ml, and a fixed dose per animal, e.g. 50 mg, a 300 g rat (A) would receive 50 mg per injection; for a dose related to body weight, e.g. 50 mg per 100 g, a 300 g (B) rat would receive 150 mg per injection. For two doses a day, rat A would receive a dosage of 100 mg per day, rat B 300 mg per day. For a treatment of twice a day for two weeks, rat A would receive a total dosage of 1.4 g, rat B would receive 4.2 g.

Drug administration
Identify a drug administration schedule by dose, agent (base or salt) and route of administration, which may be abbreviated as intra-arterial (ia), intra-cerebro-ventricular (icv), intra-gastric gavage (ig), intra-muscular (im), intra-peritoneal (ip), intra-venous (iv), per os (po), subcutaneous (sc). Drug dosage is expressed per kg body weight in all species.

Isotopes
For isotopically-labelled compounds, use square brackets placed immediately in front of the name or formula to enclose superscript figures immediately in front of the atomic symbol. Examples: [14C]urea, [α-32P]ATP (not AT32P), sodium [14C]formate, [1-14C,2-13C]acetaldehyde, [carboxy-14C]leucine, [1-3H]ethanol. Both [131I]iodo-albumin and 131I-albumin are correct.
The SI unit for radioactivity is Becquerel (Bq): 1 Ci = 37x109 disintegrations per second (37 GBq).
Disintegrations per minute (dpm), not counts per minute (cpm), should be converted to Bq for presentation.

Repetition
Note that an experiment repeated twice is not done two times. An experiment repeated once is done the first time and then again, so is done twice; likewise, an experiment repeated twice is done three times.
Note that three times as much as is not the same as three times more than. Once more than (e.g. 3 [+3] = 6) means twice as much (6 = 2 x 3); likewise three times more than (e.g. 3 [+3 +3 +3] = 12) means four times as much (12 = 4 x 3).

Sonication
Give the power (W), time of bursts, number of bursts, interval between bursts and temperature.

Spectrophotometry
Absorbance (A) values are used instead of optical density (OD) or extinction (E) values.

Units
Use of standard abbreviations and SI units of measurement (Le Système international d'unités) is encouraged. Measurements that are not usually converted to SI units in biomedical applications are blood and oxygen pressures, enzyme activity, H+ concentration, temperature and volume. SI does not stipulate whether l or L be used to indicate litre. L is often used to avoid confusion with I (capital i) or 1 (the number).
Symbols for units are not plural (kg not kgs) and are not followed by a full stop (min not min.).
Prefixes should be used rather than superscripts (5 µmol not 5×10-6 mol).
Add spaces between values and units (except g [RCF], %, ˚C) and either side of ±.
Repeat units after all the values for areas (18 mm × 18 mm) and volumes (1 cm x 1 cm x 1 cm), and repeat multipliers in ranges (20x106–60x106).
Do not repeat units in ranges (8,000−10,000g, 25–30%, 36–38˚C, 3–8 g) or for mean and dispersions (19 ± 3%, 35 ± 6˚C, 13 ± 4, 8 ± 3 g, 17 ± 3 nmol.L-1.g-1).
Do not repeat multipliers in ranges (61.2 ± 1.2 x106/ml).

Semen analysis
AJA adopts WHO (2010) terminology5: for characterisation of spermatozoa in semen, use normozoopermia (not normospermia), azoospermia (not aspermia [which means no semen]), oligozoospermia (not oligospermia), teratozoospermia (not teratospermia), asthenozoosermia (not asthenospermia). Degrees of oligozoospermia (mild or severe) are not WHO-sanctioned, and should be defined if used.
Do not confuse sperm concentration (sperm numbers per unit volume of semen or suspension) with sperm output (total sperm numbers per ejaculate) or sperm count (total sperm numbers per suspension or inseminate).
Do not use sperm density to mean sperm concentration, or use sperm count to mean sperm output.

Statistical tests
All steps in the statistical analysis should be described. Choose suitable techniques for the statistical treatments.
Statistical tests that can be used for Gaussian (normal) distributions (so-called parametric tests) include those for comparing independent (unmatched) groups, for example: Student's t test (for two groups only), One Way Analysis of Variance (ANOVA) (for three or more groups), Two Way ANOVA (for two combination of factors) and Three Way ANOVA (for three combinations of factors). Comparing samples with repeated measures (matched groups) involves, for example, the Paired t test (for two groups only), One Way Repeated Measures (RM) ANOVA (for three or more groups) and Two Way RM ANOVA (for two combinations of factors). Correlations of Gaussian groups involve Linear Regression.
There are fewer tests for non-Gaussian distributions (non-parametric tests), for example: for independent (unmatched groups) the Mann-Whitney Rank Sum Test (Wilcoxon Rank Sum test [Mann-Whitney U-test, Mann-Whitney-Wilcoxon test, Wilcoxon-Mann-Whitney test]: for two groups only) and Kruskal-Wallis ANOVA on Ranks (for three or more groups), and for repeated measures (matched groups) the Wilcoxon Signed Rank Test (for two groups only) and the Friedman RM ANOVA on Ranks (for three or more groups). Correlations in non-Gaussian groups involve the Spearman Rank Correlation.

For two or three combinations of factors (matched or unmatched non-Gaussian populations) a transformation to Gaussian distributions is needed, followed by the Parametric tests mentioned above.

Transformations

These include addition, subtraction, division, squaring, converting to absolute values, taking logarithms (logn, log10), reciprocals, exponentials, square roots, cube roots and arcsin square roots (preferable for percentages).

Sperm variables such as sperm concentrations, total sperm number and percentages of motile, viable or morphologically normal spermatozoa are usually highly skewed and not suitable for parametric statistical analysis. Such data should be either analysed by non-parametric tests (which sacrifice power and flexibility) or by conventional parametric tests after power transformations, usually cube-root7 or log8. Where azoospermia is present, log transformation is unsuitable and power transformation should be used.

Post hoc tests

If the statistical tests indicate $P < 0.05$, there are significant differences within the dataset; post-hoc tests are used to find out which groups differ from which. A less conservative test is more likely to indicate a significant difference when there is really none (a Type I error) and a more conservative test may not indicate a significant difference when there is one (a Type II error). It is better to err on the side of a Type II error, so that any significant differences reported are probably true. Which post-hoc test is used depends on whether comparison are made with a control group (C) or all pair-wise comparisons (AP).

For robust results, these post hoc tests in order of preference for Gaussian distributions are, for example: for two groups (t test, paired t test) the t-statistic, and for more than two groups (1W, 1WRM, 2W, 2WRM, 3W ANOVA) the Holm-Sidak test (AP+C, more conservative than Tukey, Bonferroni), Dunnett's test (C, less conservative than Bonferroni), Tukey test (AP+C, more conservative than SNK), Student-Newman-Keuls's (SNK) test (AP), Bonferroni's t test (AP+C), Fisher's Least Squares Difference (LSD) test (AP+C, least conservative, not recommended), Duncan's Multiple Range test (AP, not recommended).

For non-Gaussian distributions there are some restrictions on the groups that can be compared. The post-hoc tests are, for example: for two groups (Mann-Whitney Rank Sum test) the t-statistic and for more than two groups (Kruskal-Wallis, Friedman RM, ANOVA on Ranks) Dunn's test (AP+C, allowing missing values and unequal group size), the Tukey test (AP+C, no missing values allowed), the SNK test (AP, equal group size needed) and Dunnett's test (C, equal group size needed).

Other experimental designs will require other tests such as Chi-squared test, Ridit, probit, logit analysis, regression (curvilinear, stepwise), correlation, analysis of covariance. P values should be given exactly where greater than 0.001. Values such as ED50, LD50, IC50 should have their 95% confidence limits calculated and compared by weighted probit analysis6.

The word 'significantly' should be replaced by synonyms (e.g. appreciably, considerably, markedly) if it is used qualitatively to indicate extent, or accompanied by its P value if it is used quantitatively to indicates statistical significance.

Results

This section may be divided into subheadings to assist the reader. Large datasets or other cumbersome data pertinent to the manuscript may be submitted as Supplementary

Information. The description of results should not reiterate data that appear in Tables and Figures and, likewise, the same data should not be displayed in both Tables and Figures.
The Results section should be concise and follow a logical sequence. If the paper describes a complex series of experiments, it is permissible to explain briefly the protocol or experimental design of each part before presenting the results.
Do not comment upon or discuss the results, or draw any conclusions in this section.
Presentation of numerical data
Thought should be given to whether to describe the data by use of standard deviation (an estimate of the dispersion of the whole data) or by standard error (an estimate of the precision of the mean).
Give the number of observations and subjects used to derive the measure of the central tendency (mean, median) of the data. Losses in observations, such as drop-outs from the study should be reported. For clinical trials a CONSORT flow diagram is strongly encouraged.
Do not include more significant digits than are justified by the accuracy of the measurements. For example, a man may weigh 72 kg, a rat 302 g and a mouse 7.2 g, if assessed on scales or balances with accuracies of 1 kg, 1 g and 0.1 g, respectively.
For displaying means, the number of significant digits presented is determined by the variation within the sample. Give the averaged data to one significant digit more than that of the accuracy of measurement. This may involve choosing units or multipliers to place the decimal point as close as possible to the uncertainty of the measurement. Report the value of the mean to the same order of magnitude as that of the rounded SD.
For example, convert weights of 3863.42 ± 2162.3 mg to 3.86342 ± 2.1623 g and round this value to 3.863 ± 2.162 g (if measured on a balance of sensitivity 0.01 g) or 3.86 ± 2.16 g (for a balance of sensitivity 0.1 g).
When rounding whole numbers to the nearest whole number with fewer places, the 'tie-breaking' convention is to round values from 1 to 4 down, and values from 5 to 9 up; e.g. 325 up to 330, 324 down to 320.
When rounding decimal numbers to the nearest whole number (without decimals), the 'tie-breaking' convention is to round values from 0.1 to 0.4 down, and values from 0.5 to 0.9 up; e.g. 32.5 up to 33, 32.4 down to 32.
Ejaculated sperm concentrations are expressed as million spermatozoa per ml and accompanied by total sperm output (million spermatozoa per ejaculate). Sperm concentrations in the text should be given as (106/ml) or x106/ml (which indicates that the number written (e.g. 60) is to be multiplied by the factor 106 [giving 60,000,000/ml], not x10-6 (which indicates that the number written (e.g. 60) is to be multiplied by 10-6 [giving 0.000060/ml]).
By contrast, for sperm concentration in Tables and Graphs, the multiplier in column headings and axis labels should be either (106/ml) or x10-6/ml (which indicates that the number tabulated or plotted (e.g. 60) is already a million times smaller than the value it represents and so is to be multiplied by the factor 106 [giving 60,000,000/ml]).

Discussion
Do not repeat the Introduction here.
Do not recapitulate the results, or refer to Figures and Tables, in this section, but (i) mention whether the results agree with or contradict previous findings, (ii) discuss the significance of the results against the background of existing knowledge, (iii) identify clearly those aspects that are novel, and (iv) state if the original hypothesis was confirmed.

The final paragraph should highlight the main conclusion(s), and provide some indication of the direction future research should take. This section may be divided into subheadings to assist the reader.

Authors' Contributions

Authors are required to state their contributions to the manuscript. The statement can be of several sentences, describing the tasks of individual authors referred to by their initials. Use the following format: JDE carried out the genetic studies, participated in the proteomic analysis and drafted the manuscript; JSR carried out the immunoassays and performed the statistical analysis; JMP conceived of the study, and participated in its design and coordination and helped to draft the manuscript.

Add a statement that all authors have read and approved the final version of the manuscript, and agree with the order of presentation of the authors.

Competing Interests

State if there is any competing interest of any sort. If there is no financial interest, use the following format: None of the authors declare competing financial interests.

Acknowledgements

These should be brief, and should include sources of financial support, material (e.g. novel compounds, strains, etc.) not available commercially, personal assistance, advice from colleagues and gifts.

Acknowledgements should be made only to those who have made a significant contribution to the study. Authors should submit to AJA written permission given by individuals named in this section.

References

Authors are responsible for the accuracy of the references. These may include published articles as well as those in press (but for these, state the name of the journal and enclose a copy of the manuscript).

In the text of the manuscript, references to the literature should be numbered consecutively and indicated by a superscript. Each reference should be numbered individually and listed at the end of the manuscript; examples of citation format are given below.

All authors should be listed for papers with up to five authors; for papers with more than five, the first five authors only should be quoted, followed by et al.

Note: An EndNote style file is available to download here.

Examples of journal citation format

1 Dai B, Ye DW, Kong YY, Shen YJ, Wang BH. Individualized prostate biopsy strategy for Chinese patients with different prostate-specific antigen levels. Asian J Androl 2008; 10: 325-31.

2 Mao X, Shaw G, James SY, Purkis P, Kudahetti SC et al. Detection of TMPRSS2:ERG fusion gene in circulating prostate cancer cells. Asian J Androl 2008; 10: 467-73.

Example of a book citation:

3 Armitage P. Statistical Methods in Medical Research. Oxford: Blackwell Scientific Publishers; 1971. p239.

Example of an article in a book:

4 Morley JE, Kaiser FE, Jonson LE. Male sexual function. In: Cassel CK, Riesenberg DE, Sorensen LB, Walsh JR, editors. Geriatric Medicine. New York: Springer-Verlag; 1990. p25670.

The names of journals cited should be abbreviated according to the 'International List of Periodical Title Word Abbreviations'10.
Citations of 'unpublished data' and e.g. 'S. A. Waksman, personal communication' should be written in the text parenthetically.
Abstracts may be cited only if they are the sole sources, and must be identified in the reference list as '(Abstract)'.
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Tables
Tables are useful for presentation of entire data-sets, and for results where little change between treatments occurs. (Figures here may show parallel lines that are difficult to distinguish from the overlapping symbols and error bars.)
Tables must supplement, not duplicate, the data in the text or Figures.
Tables should consist of at least two columns; columns should always have headings.
Present data as a central tendency and the extent of dispersion (mean ± SD [if a Gaussian distribution] or median and quartiles or 5th and 95th centiles with outliers [if non-Gaussian]).
They should have a title and be numbered sequentially as Table 1, Table 2, etc. and cited sequentially in the text.
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Figures
Figures are useful to highlight clear differences between treatment groups, where lines may diverge and symbols and errors bars do not overlap. (Tables here require concentrated attention to locate the superscript indices of statistical differences between columns or rows.)
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The resolution of all Figures should be at least 300 dpi; grey-scale pictures (imprinting maps, black and white drawings), should be at least 600 dpi; line graphs, bar charts and illustrations, should be at least 1000 dpi. For colour printing, the RGB mode needs to be transformed into the CMYK mode.

Provide Figures that are compatible with the actual printed sample: 80 mm width (single column) and 160 mm width (double column).
Each Figure number should be in about 8 pt, bold or regular Arial font; all Figure panel labels should be in lower case letters, about 8 pt bold Arial font; words in Figures should be in about 5—7 pt regular Arial font, but amino acids and gene sequence lettering should be in Courier font.
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Colour figures can be reproduced if necessary, but the authors are expected to contribute towards the cost of publication. A quotation will be supplied upon acceptance of the paper (see Costs).

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It is posted on the journal's website and linked to the article when the article is published and may consist of data files, graphics, movies or extensive tables.
It must be supplied to the editorial office for peer review, and on acceptance, the final version of the peer-reviewed Supplementary Information should be submitted with the accepted paper.
To ensure that the contents of the Supplementary Information files can be viewed by the editors, referees and readers, submit a ‘read-me’ file containing brief instructions on how to use the file.

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If applicable to the presentation of the Supplementary Information, use a 256-colour palette. Consider the use of lower specification for all of the above if the Supplementary Information can still be represented clearly. A maximum data rate of 150 KB/s is recommended.

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Further questions about the submission or preparation of Supplementary Information should be directed to the Editorial Office.

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If editors or referees cannot follow the narrative description of rationale, experimental design, finding or interpretation of a study owing to language problems, it can lead to rejection of scientifically valid research.

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• Have your manuscript reviewed for clarity by a colleague whose native language is English.
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  MedSci
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A letter acknowledging receipt will be sent to the corresponding author by email. During the review process, authors can check the status of the submitted manuscript via the online manuscript submission and review system.

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All submitted manuscripts are reviewed initially by the AJA Associate Editors or board members. Manuscripts are evaluated according to the following criteria: the material is original and timely, writing is clear, study methods are appropriate, data are valid, conclusions are reasonable and supported by the data, information is important, and the topic has general interest for andrologists. From these criteria, the editors decide whether a manuscript justifies peer review.
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Apêndice 1 – Termo de Consentimento Livre e Esclarecido

Você está sendo convidado (a) para participar, como voluntário, em uma pesquisa. Meu nome é MÁRCIO RODRIGUES COSTA, sou o pesquisador responsável e minha área de atuação é UROLOGIA.

Após ler com atenção este documento e ser esclarecido (a) sobre as informações a seguir, no caso de aceitar fazer parte do estudo, assine ao final deste documento, que está em duas vias. Uma delas é sua e a outra é do pesquisador responsável. Em caso de dúvida sobre a pesquisa, você poderá entrar em contato com os pesquisadores responsáveis, Dr. MÁRCIO RODRIGUES COSTA, Dra. VIVIANE CAMPOS PONCIANO ou Dr. ENIO CHAVES DE OLIVEIRA, nos respectivos telefones: (62)30963200 (62) 3261-4711 e (62) 96148052.

Em caso de dúvidas sobre os seus direitos como participante nesta pesquisa, você poderá entrar em contato com o Comitê de Ética em Pesquisa do Hospital das Clínicas da Universidade Federal de Goiás, nos telefones: 32 69 83 38 – 32 69 84 26.

INFORMAÇÕES IMPORTANTES QUE VOCÊ PRECISA SABER SOBRE A PESQUISA:

 Título:

"ESTUDO DA PREVALÊNCIA DE DISFUNÇÃO ERÉTIL EM PACIENTES EM HEMODIÁLISE E EM PORTADORES DE DOENÇA RENAL CRÔNICA NÃO DIALÍTICA EM GOIÂNIA"

 Informações sobre quem está aplicando o termo de consentimento:

Você vai receber esse termo de consentimento informado que será aplicado e explicado por Dr. MÁRCIO RODRIGUES COSTA, pesquisador responsável por este estudo.

 Objetivos da pesquisa:

Essa pesquisa quer mostrar o tamanho do problema de disfunção erétil entre os homens que têm doença renal crônica que fazem ou não hemodiálise em Goiânia.

A pesquisa também deseja mostrar aquilo que pode alterar para mais ou menos a gravidade da disfunção erétil nestas pessoas que têm doença renal crônica que fazem ou não hemodiálise em Goiânia.

 Detalhamento dos procedimentos:

A coleta das informações será feito da seguinte maneira: O pesquisador irá aplicar em você um questionário sobre disfunção erétil e preencherá um protocolo que contem informações sobre sua doença, sua condição social, seu nível escolar, seus exames médicos e também outras informações do seu prontuário. Essa coleta de informações será feita pouco antes, pouco depois ou durante as sessões de hemodiálise ou durante as consultas de acompanhamento médico.

 Forma de acompanhamento:

Você será entrevistado apenas uma vez. Se for constatado algum problema de ereção e você desejar tratamento, então será encaminhado para o atendimento ambulatorial da rede conveniada do SUS.

 Especificação dos riscos, prejuízos, desconforto, lesões que podem ser provocados pela pesquisa:

Você pode se sentir desconfortável em responder as perguntas, caso isso ocorra, você terá total liberdade para interromper sua participação e receberá do pesquisador total amparo para reparação de possíveis prejuízos ou lesões ligadas a sua participação na pesquisa.

 Informação sobre o direito de pleitear indenização em caso de danos decorrentes de sua participação na pesquisa:

Você pode pedir indenização em caso de danos comprovados devido a sua participação na pesquisa.

 Informação sobre o direito de ressarcimento de despesas pela sua participação:

Você será ressarcido se ocorrerem despesas devido a sua participação nesta pesquisa.

 Esclarecer que não haverá nenhum tipo de pagamento ou gratificação financeira pela sua participação:

Você não terá nenhum tipo de pagamento ou gratificação financeira pela sua participação nesta pesquisa.

 Descrever os benefícios decorrentes da participação na pesquisa:

Ao responder o questionário, você poderá ajudar a mostrar o tamanho do problema de disfunção erétil nos pacientes portadores de Doença Renal Crônica que realizam ou não Hemodiálise e desta forma, chamar a atenção dos profissionais de saúde para importância da doença nesta população.

 Detalhar intervenções, tratamentos, métodos alternativos existentes:

Nenhum de vocês sofrerá intervenções ou será submetido a métodos alternativos de tratamentos. Se você desejar tratamento da disfunção erétil será encaminhado para o atendimento ambulatorial da rede conveniada do SUS.

 Esclarecimento sobre o período de participação e término:

Você irá participar da pesquisa apenas no período da aplicação dos questionários e terminará sua participação ao final do preenchimento destes questionários (o que deve durar ao todo aproximadamente 20 minutos).

 Garantir o sigilo:

Seu nome será mantido em sigilo. Os resultados da pesquisa serão enviados para você (caso você deseje) e permanecerão confidenciais. Seu nome ou o material que indique a sua participação não será liberado sem a sua permissão. Você não será identificado em nenhuma publicação que possa resultar deste estudo. Uma cópia deste consentimento informado será arquivada no Departamento de Cirurgia do Hospital das Clínicas da Universidade Federal de Goiás e outra será fornecida a você.

Se os dados desta pesquisa forem utilizados em outros estudos, o novo projeto será analisado por um comitê de ética em pesquisa.

 Apresentar a garantia expressa de liberdade de não aceitação, bem como de retirar o consentimento, sem qualquer prejuízo da continuidade do acompanhamento/tratamento usual:

Você é livre para recusar-se a participar, retirar seu consentimento ou interromper a participação a qualquer momento. A sua participação é voluntária e a recusa em participar não irá acarretar qualquer penalidade ou perda de benefícios.

Nome e Assinatura do pesquisador_____

Dr. MÁRCIO RODRIGUES COSTA

CONSENTIMENTO DA PARTICIPAÇÃO DA PESSOA COMO SUJEITO DA PESQUISA

Eu,_____
_____, RG_____/CPF_____/nº de prontuário_____ / nº de matrícula_____, abaixo assinado, concordo em participar do estudo "ESTUDO DA PREVALÊNCIA DE DISFUNÇÃO ERÉTIL EM PACIENTES EM HEMODIÁLISE E EM PORTADORES DE DOENÇA RENAL CRÔNICA NÃO DIALÍTICA EM GOIÂNIA", sob a responsabilidade do Dr. MÁRCIO RODRIGUES COSTA como sujeito voluntário. Fui devidamente informado e esclarecido pelo pesquisador Dr. MÁRCIO RODRIGUES COSTA sobre a pesquisa, os procedimentos nela envolvidos, assim como os possíveis riscos e benefícios decorrentes de minha participação. Foi me garantido que posso retirar meu consentimento a qualquer momento, sem que isto leve a qualquer penalidade ou interrupção de meu acompanhamento/ assistência/ tratamento.

Local e data_____

Nome e Assinatura do sujeito ou responsável:_____

Assinatura Dactiloscópica:

Nome e assinatura do Pesquisador responsável

_____

Dr. MÁRCIO RODRIGUES COSTA

Presenciamos a solicitação de consentimento, esclarecimento sobre a pesquisa e aceite do sujeito em participar.

Testemunhas (não ligadas à equipe de pesquisadores):

Nome:

_____

Assinatura:

_____

Nome:

_____

Assinatura:

_____

□ □ Observações complementares:

_____
_____
_____
_____

Formulário 1 – Formulário de pesquisa

Paciente: _____ Prontuário: _____
Portador de DRC não dialítica ( ) Paciente em hemodiálise ( )

Instituição:
( ) CENTREL-Centro de Nefrologia e Transplante Renal LTDA ( ) HC- Hospital das Clínicas da UFG
( ) CDR-Clínica de Doenças Renais LTDA ( ) HGG-Hospital Geral de Goiânia
( ) Nefron-Clínica do Rim e Hemodiálise LTDA

Peso:_____kg Altura:____m IMC_____ Data de nascimento:_____
Idade_____anos Tempo em Hemodiálise_____ Tempo de diagnóstico de DRC_____

Estado civil:
Solteiro ( ) Casado ( ) Viúvo ( ) Separado/Divorciado ( )
Namorada/Parceira fixa ( ) Parceira não fixa ( ) Outros ( ) _____

Escolaridade (anos):_____
Sem escolaridade ( ) Educação infantil incompleto ( ) Educação infantil completo ( )
Ensino fundamental incompleto ( ) Ensino fundamental completo ( ) Ensino médio incompleto ( )
Ensino médio completo ( ) Ensino superior incompleto ( ) Ensino superior completo ( )

Comorbidades
Hipertensão arterial ( ) Tempo_____ Diabetes Mellitus ( ) Tempo____ Litíase urinária ( )
ITU prévia ( ) Cardiopatia ( ) Doenças prostáticas ( )
Outras _____
Causa da falência renal:_____
Antecedentes_____

Hábitos de vida:
Tabagismo ( ) Se sim, quantos cigarros /dia e há quantos anos_____
Ex-tabagista ( ) Parou há quanto tempo_____ Se sim, quantos cigarros /dia e por quantos anos_____
Uso de bebida alcoólica ( ) Se sim, que tipo de bebida e qual há quantidade por dia ou semana_____
Ex-etilista ( ) Parou há quanto tempo_____ Se sim, que tipo de bebida e qual há quantidade/dia ou semana_____
Uso de drogas ilícitas ( ) Se sim, que tipo_____
Ex-usuário de drogas ( ) Se sim, que tipo_____

Medicações em uso:
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Dados laboratoriais e sua respectiva data de coleta:
Hematócrito_____ (/ /) Hemoglobina_____ (/ /)
Cálcio_____ (/ /) Fósforo_____ (/ /)
Potássio _____ (/ /) Albumina_____ (/ /)
Ferritina_____ (/ /) Ferro_____ (/ /)
Colesterol total e frações_____ (/ /) Triglicérides_____ (/ /)

TGP_____	(/ /)	Creatinina pré diálise_____	(/ /)
Uréia pré diálise_____	(/ /)	Uréia pós diálise_____	(/ /)
PTH_____	(/ /)	Valor de Kt/V:_____	(/ /)
Clearance de creatinina_____	(/ /)		

_____

Nome e Assinatura do Pesquisador