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## EVIDENCE OF ERECTILE DYSFUNCTION AS A PREDICTOR OF CARDIOVASCULAR DISEASE: INTEGRATIVE REVIEW

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### ABSTRACT

The Erectile dysfunction is the main male sexual dysfunction and may be an early manifestation of cardiovascular disease because by sharing risk factors, etiology and clinical evolution, based on endothelial dysfunction. This is an integrative review with the objective of verifying the available evidence in the literature on erectile dysfunction as a predictor of cardiovascular disease. Data collection was carried out from October to November 2017. Articles published in full between January 2012 and September 2017 were included. A sample of 11 (eleven) articles was obtained. The correlation of coronary disease with erectile dysfunction has a profound association with the cellular and vascular changes of the arterial vessels. The subclinical relationship is confirmed by the associated symptoms of mild degrees of erectile dysfunction that may show the cardiovascular disease involved. The deficiency of endothelial vasodilation influences the pathophysiology of erectile dysfunction, considering an additional risk for coronary disease in men without clinical presentation or constituting an aggravation in those with established heart disease. Erectile dysfunction is an important marker for the finding of coronary disease and is considered a manifestation that may precede vascular disease and/or high-risk cardiovascular events.

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### INTRODUCTION

Sexuality and corporeality are topics that still cause great controversy in our society, especially for the cultural and educational heritage full of taboos, narratives, and stigma (AMARO, 2015). The diagnosis of sexual dysfunction is essentially clinical and the main instrument of diagnostic evaluation is the interview. Dysfunction is considered when persistent or recurrent; causing interpersonal and personal suffering. It is necessary to understand the onset of the disease (primary or secondary), the context (generalized or situational) and if there are other associated factors, coming from another

etiology (psychological, organic, unknown or combined). In this perspective, the sexual function is dependent on the contexts it happens, since several factors can interfere its result (CARVALHEIRA; GOMES, 2011). The evaluation of the nature and extent of dysfunction is of fundamental importance for an effective therapeutic intervention (OIGMAN, 2014). Erectile dysfunction is a persistent inability to achieve and maintain an erection suitable for satisfactory sexual performance. Erectile dysfunction and vascular failure such as the coronary disease share risk factors, etiology, and clinical evolution, with the possibility of endothelial dysfunction as the common denominator (DEROGATIS; BURNETT, 2008). Erectile dysfunction is a vascular risk factor and can be considered as a sign of cardiovascular disease (VIEIRA,

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2015). Although there is a correlation between the common risk factors for the erectile dysfunction and the cardiovascular diseases, such as age, smoking, diabetes, obesity, dyslipidemia, and hypertension, there is lack of knowledge that erectile dysfunction and cardiovascular disease only share risk factors and similar causes. It is suggested that erectile dysfunction is, in fact, an early manifestation of cardiovascular disease, based on endothelial dysfunction, since the deficiency in endothelium-mediated vasodilation is the main factor in the pathophysiology of erectile dysfunction (LAYDNER *et al.*, 2009). It is believed that vascular disease of the penile arteries contributes to 70-80% of the cases of erectile dysfunction and the diagnosis of dysfunction in coronary patients correlates with the extent/severity of the disease (PERDIGÃO; RABAÇAL; GIL, 2008).

### Objective

- To describe the available evidence in the literature on erectile dysfunction as a predictor of cardiovascular disease.

### MATERIALS AND METHODS

This is an integrative literature review. The period of data collection was between October and November 2017. A six-step model was used to analyze the articles (JACKSON, 1980). From the guiding question and the objectives of the research, the keywords for translating the documentary language or descriptors in the Descriptors in Health Sciences (DeCS) were obtained, combined with the boolean operators “and” and “or”. The following databases were selected for the mobilization of primary sources: National Library of Medicine National Institutes of Health (PubMed/MEDLINE), Latin American and Caribbean Literature in Health Sciences (LILACS), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Virtual Health Library (VHL). The inclusion criteria were original studies published in full, from January 2012 to September 2017, which answered the research question, addressing sexual dysfunction or erectile dysfunction, cardiovascular risk or cardiovascular or coronary disease in the title or abstract; studies published in Portuguese, English or Spanish. For the selection of the studies, the recommendations of PRISMA (Main items to report systematic reviews and meta-analyses) were followed: identification, selection, eligibility, and inclusion. A spreadsheet was used for the elaboration of a structured summary about each article consulted. The degree of adequacy of each article was evaluated by a Likert scale of four (4) points, according to the criteria and methodological quality of the results. This research was conditioned to the favorable opinion of the College of Nursing Course of the Federal University of Maranhão (UFMA).

### RESULTS AND DISCUSSION

The 11 articles selected were identified in the following index databases: LILACS (n=2), CINAHL (n=1), BVS VHL (n=4) and PUBMED (n=4). There are several multidimensional methods to evaluate the ED, with the IIEF and the Male Sexuality Quotient (QSM) as the most commonly used (SARRIS, 2016). Six (54.5%) articles aimed to investigate the relationship between erectile dysfunction and heart disease using laboratory, physical, imaging, and questionnaires with great investigative power and related to evaluations of sexual function by score. Four (36.3%) articles aimed to predict the relationship of erectile dysfunction with heart disease by

studying vascular function, and finally, 01 (9.4%) article aimed to work the association of erectile dysfunction with heart disease through a study of sexual behavior. In the investigation by Canat *et al* (2013), the negativity of erectile function was more significant in patients with coronary artery disease who had a history of involvement of three coronary vessels. Individuals with the coronary artery disease with multiple vessel lesions, when related to the history of arterial hypertension, had negative erectile function than patients with only one or two vessel lesions, the last two of which did not correlate significantly. The investigation of Shanker; Phanikrishna; Reddy (2013), a significant increase for a greater prevalence of patients with lesion of two or vessels was not obtained when compared with only one coronary artery. Gazzaruso *et al.* (2004) did not show a substantial relationship of erectile dysfunction with the extension of coronary artery disease measured from the number of coronary vessels, which did not exclude the association of erectile dysfunction with coronary artery disease, especially in diabetic men. Reriani, Lerman, and Lerma (2010) found a significant correlation of diabetic men who presented a higher degree of erectile dysfunction evaluated by the IIEF score. Men with single vessel lesions have better erections compared to men with multiple vessel lesions (LAYDNER *et al.*, 2009). The initial presentation of stable angina, that is, in patients with chronic coronary artery disease is more related to the reduction of erectile function when compared to erectile dysfunction in acute presentation (JAVARONI; OLGMAN; NEVES, 2011).

The studies of Montorsi (2003); Vachopoulos (2005); Riedner (2010); Feldman *et al* (2016) associate the erectile dysfunction as an antecedent event to the presentation of coronary diseases. In the study by Montorsi *et al* (2003), the symptoms became clinically evident before the onset of coronary disease in 67% of patients. Age advancement was found as an important factor in increasing rates of erectile dysfunction (RHODEN, 2002; CANAT, 2013). Vlachopoulos (2005) concluded that there is an association between microvascular endothelial dysfunction, comorbidities and increased age. Besides to the hypertension, there was a prevalence of diabetes mellitus, smoking and hypercholesterolemia also observed in 65% of individuals in the survey by Chaudhary *et al* (2016). Djordjevic *et al* (2015) concluded that hypertension in patients diagnosed with erectile dysfunction contributed to a significant discrepancy between vascular age and chronological age compared to the group of patients diagnosed with ED and type 2 diabetes mellitus. Vlachopoulos C, Rokkas K, Ioakeimidis N, *et al.* Prevalence of asymptomatic coronary artery disease in men with vasculogenic erectile dysfunction: a prospective angiographic study. *Eur Urol.* 2005; 48:996-1000. Feldman *et al* (2016) destaca em seu estudo a correlação substancial da doença aterosclerótica com a disfunção endotelial, sendo um achado significativo em sua investigação quando as anormalidades ateroscleróticas estiveram fortemente associada à DE subsequente. Nas investigações de (BONETTI; LERMAN, 2003; RERIANI; LERMAN; LERMA, 2010; SHANKER, PHANIKRISHNA; REDDY, 2013) a aterosclerose foi importante fator na associação entre a menor quantidade de vaso envolvido na coronariopatia e a carga aterosclerótica, o que contribuiu para a prevalência menor de DE em pacientes com acometimento de um único vaso em relação aos grupos com acometimento de dois ou mais vasos. In the study by Feldman *et al* (2016), there were 839 patients (45%) having symptoms of erectile dysfunction. In the investigation by Reriani *et al* (2014), 68% of the patients presented

microvascular endothelial dysfunction with considerable significance for the development of erectile dysfunction. The family history of coronary artery disease was reported by 60% of the individuals. When compared to non-coronary artery disease patients, coronary artery disease patients are potentially more likely to develop or already have erectile dysfunction, which may be increased proportionally to the compromise of coronary vessels (TABOSA et al, 2017).

## Conclusion

Risk factors for coronary artery disease are shared by dysfunction. This is a fact with considerable evidence in the evaluated articles. Erectile dysfunction in its varying degrees of severity is an important marker for the finding of coronary heart disease in men because it represents the event before a heart disease. The entire arrangement in the endothelial vasodilation deficiency influences the pathophysiology of erectile dysfunction, considering an additional risk for coronary disease in men without clinical presentation or constituting an aggravation for the disease in those whose diagnosis of coronary artery disease is established.

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