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David N. Piper
Lake Forest College

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A Review of “Prospective Study of Risk Factors for Erectile Dysfunction” by Bacon et al.

David N. Piper*

Department of Biology
Lake Forest College
Lake Forest, Illinois 60045

Summary

Recent studies have indicated a possible link between risk factors associated with cardiovascular disease and cancer to an increased prevalence of erectile dysfunction. Smoking, weight, and exercise were all assessed in respect to erectile dysfunction in a study conducted by Bacon et al.

Introduction

Erectile dysfunction (ED) is the failure to gain or maintain an erection.² This impairment is seen more prevalently among older men and rates greatly increase after the age of sixty.³ Although ED occurs commonly, its etiology is poorly understood. The process by which an erection occurs must thoroughly be understood before treatments can correct ED. The first phase of the male sexual response is that of excitement, initiated by an erotic stimulus. During this phase, the penis hardens and increases in both length and diameter as the result of being engorged with blood. The penis can also become erect without the presence of an erotic stimulus: for example, many men experience erections every thirty to ninety minutes at night during rapid eye movement sleep, or in the morning upon waking.²

In the male sexual response, an erotic stimulus initiates nerve pulses that are sent either directly to the spinal cord or from the brain to the spinal cord. These nerve impulses create an erection reflex by activating the erection center found at the lower end of the spinal cord that contains erection-controlling neurons. The parasympathetic nerves of the erection center activate, resulting in the neural release of acetylcholine, which consequently causes the arterioles that supply the erectile tissue with blood to dilate.

Arteriole dilation results in vasocongestion, or tissue swelling, within the blood vessels of the corpora cavernosa and corpus spongiosum, the two primary sponge-like tissues that run the length of the penis. This excess blood in the tissue results in engorgement of the tissue causing penile tumescence, or swelling. When these processes are inhibited or halted, the result is erectile dysfunction. Limited knowledge on the etiology of erectile dysfunction has made identifying risk factors a difficult process. Recent cross-sectional studies have shown inconsistencies when correlating erectile dysfunction and sedentary lifestyle,⁴ smoking,^{5,6} alcohol use,⁶ and obesity,⁵ with some studies supporting and some refuting these correlations. A number of these studies are limited in scope because of small patient populations. Furthermore, some of these studies are done with male participants who are already in the age range of the exponential increase of erectile dysfunction.¹ Due to these weaknesses, Bacon et al. set out to perform a

large prospective study of erectile dysfunction that assessed the modifiable risk factors linked to chronic heart disease.

Lifestyle choices including no smoking, drinking in moderation, maintaining an ideal body weight, and regularly performing physical activities have been shown to reduce the risk of acquiring diabetes, cardiovascular disease, and chronic diseases.¹ Inspired by these types of studies, Bacon et al. assessed the risk factors associated with chronic diseases in relation to erectile dysfunction in hopes of demonstrating a correlation that would promote a healthy lifestyle for men. This type of motivation based on immediate sexual function could more importantly prevent the onset of life-threatening diseases. Before conducting their study, Bacon et al. had no knowledge of similar studies being conducted that were adequately comprehensive in assessment of modifiable risk factors.

Bacon et al. studied 22,086 American subjects from the Health Professionals Followup Study ranging from 40-75 years of age. In 2000, the subjects were issued a questionnaire asking them to rate the severity of their erectile dysfunction during several periods: before 1986, between 1986 and 1989, between 1990 and 1994, and between 1994 and 2000. Only subjects reporting good to very good erectile function and presenting no major chronic diseases prior to 1986 were included in the study. The questionnaire assessed the modifiable risk factors of smoking, weight, and exercise in correlation with ED.

The results yielded data corroborating a correlation between some of the risk factors associated with chronic diseases and erectile dysfunction. Current smokers and past smokers showed a statistically significant increase in the risk of erectile dysfunction in comparison to those men that had never smoked. Also, obese men from this group showed an increased risk of ED. In comparison to the men that had an ideal body weight (body mass index (BMI) less than 25 kg/m²), men with a BMI between 25.0-26.9 kg/m² had a 19% increased risk, men with a BMI between 27.0-29.9 kg/m² had a 33% increased risk, and obese men (those with a BMI greater than 30 kg/m²) were nearly twice at risk.¹ In contrast to the positive correlation of smoking and body weight to ED, physical activity was inversely associated with risk of erectile dysfunction. The study showed that as the average METs (Metabolic Equivalents) per week increased, the risk of erectile dysfunction inversely decreased.

Overall, men that smoked or had a history of smoking, and those with greater than ideal body weights, were more highly associated with ED than their non-smoking, healthy weight counterparts. Men partaking in regular physical activity were strongly inversely associated with the risk of erectile dysfunction. These implications help illuminate the etiology of ED and also encourage healthy behavioral choices that may lower the risk of more severe chronic diseases. For example, smoking and obesity are tied to hypertension, which may also contribute to increased ED incidences. Thus, appealing to a man's immediate sexual function may prove to be a better concrete motivator, consequently helping men to avoid risk

*This author wrote the paper for Biology 350: Reproductive Biology, taught by Dr. Nicole Sleiter.

factors that also contribute to cardiovascular disease and cancer.

Conclusion

Studies indicate that psychological factors in addition to physical factors have a link to erectile dysfunction. For this reason, studies that correlate stress and other forms of psychological factors to erectile dysfunction would be valuable. Also, studies that record erectile function ratings on a daily basis could yield more accurate data than retrospective studies like the one performed by Bacon et al. Furthermore, studies of subjects 60 years old and younger may be more useful in obtaining results undiluted by natural age-related ED cases, especially when seeking to determine the causes of ED in younger men. This study has yielded important results that both provides a strong foundation for future studies to build upon and encourages behavioral choices associated with healthier lifestyles.

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