SEXUAL MEDICINE REVIEWS

The Conception and Evaluation of Sexual Health Literature

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ABSTRACT

Introduction: Understanding the appropriate evaluation and development methods for studying the literature as it pertains to sexual health is important for those practicing within the subspecialty.

Aim: To further understand the methodology that is necessary to evaluate and design optimal studies in sexual health.

Methods: A PubMed search was performed using the terms *urologic study design, urologic validated questionnaires, clinical trials,* and *study bias.* Articles with current and relevant topics in sexual health were selected for evaluation.

Main Outcome Measure: Summary of the current state of sexual medicine literature with insights into the evaluation and development of this literature.

Results: Most of the urologic and sexual medicine literature consists of retrospective studies that have resulted in low levels of evidence. Case series, case-control studies, cohort studies, and experimental studies are designs commonly used in sexual health. There are numerous types of bias that decrease the validity of the results within the literature. There are multiple validated questionnaires that can decrease bias when collecting data. These instruments are preferred over non-validated questionnaires and can help discern whether an intervention improves a patient's quality of life. The quality of the literature varies and often reflects the incidence of the condition being studied.

Conclusion: Those caring for patients with sexual dysfunction need to recognize the quality of the literature they read and understand the means of developing the highest quality studies, recommendations, and published literature.

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Key Words: Sexual Medicine; Clinical Trials; Trial Design; Bias; Levels of Evidence; Sexual Health

INTRODUCTION

The completion of a sexual medicine study requires multiples phases. Planning is required to identify the question to be answered and to recognize the resources needed to complete the work. Investigators must decide whether they need to create primary data or if they can use data already collected (ie, case-control). Also, will the investigator require multiple institutions to collect sufficient data for the study? Once the appropriate questions have been formulated, the investigator must decide which tools will be used to provide the data of interest. In sexual health, there are many validated questionnaires (International Index of Erectile Dysfunction [IIEF], Peyronie's Disease Questionnaire [PDQ], Male Sexual Health Questionnaire [MSHQ], and Female Sexual Function Index [FSFI]) that can be used to assess specific outcomes. The investigator should attempt to provide the highest possible level of evidence within the field of study and range of resources. Most urologic and sexual medicine studies have generally consisted of low-level evidence.[1] In many cases, collaboration and appropriate planning will allow sexual medicine investigators to overcome this historical trend. In addition, quality-of-life measurements are often helpful, because diseases related to sexual health are almost entirely quality-of-life issues. A clear formulation of the questions allows for a precise study design and directed data collection. In this article, we review the study designs used in sexual health and analyze several items from the sexual health literature using the tools discussed.

Study Population

The study population significantly depends on the questions raised. Essentially, the study population is controlled by the enrollment criteria. In "experimental" studies (further clarification in the next section), the study population is frequently a group of individuals with a specific disease process.

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Cross-sectional studies can be much broader and tend to observe variables in the general population.

Sample Size

Sample size should be calculated to determine the number of analysis units needed to answer the main study question. This often necessitates consultation with a biostatistician. If the expected effect is small, then a larger sample will be required. Unfortunately, the sample size is restricted by time and cost factors not related to scientific and statistical principles. The desire to minimize the number of resources dedicated to a study must be balanced against the possibility of failure to find statistical significance when evaluating an apparently useful intervention (type II error). With rare diseases, the limited number of patients forces the literature to take on a descriptive role.

OBSERVATION STUDIES

Case Series

A case series simply describes a group of patients of interest. These studies frequently involve patients with an unusual disease process and provide low-quality evidence.

Case Control

Case-control series start with an outcome of interest and attempt to define the risk factors for that particular outcome of interest. They are especially useful when studying rare diseases because of the difficulty of recruiting a sufficient number of patients for a prospective study. Case-control studies usually involve two groups: patients with the outcome of interest and controls without the outcome of interest. Then, certain variables in these groups are compared to determine whether those variables predict the outcome of interest. This type of study retrospectively analyzes the data and can be performed more quickly than a cohort study, which seeks to determine whether certain risk factors predict a particular outcome. Unlike a case series, a case-control study is not merely descriptive. These studies are often constrained by the quality of data they are examining, because they are not planned prospectively. This method of analysis was used to determine that in utero exposure to diethylstilbestrol caused clear cell vaginal carcinoma. Eight women 15 to 22 years old with clear cell vaginal carcinoma were identified. Comparing detailed analysis of these patients showed that all had in utero exposure to diethylstilbestrol, whereas no controls had this exposure; therefore, diethylstilbestrol exposure was identified as the etiology of clear cell vaginal carcinoma in this case-control study.[2]

Cross-Sectional

Cross-sectional studies are known by different names, including *surveys, epidemiologic studies,* and *prevalence studies.* It is cross-sectional in the timeline; it captures data at one point in time. Cross-sectional studies are useful for determining the prevalence of a disease process within a given population and establishing normative laboratory values. There are several potential pitfalls when recruiting for cross-sectional studies. First, recruiting an adequate number of subjects from which to obtain data can be prohibitive and costly. Second, subjects who are willing to participate might not be representative of the population that the investigator wishes to study. For example, the Massachusetts Male Aging Study (MMAS) showed an age-related decrease in testosterone levels in men 45 to 79 years old. However, the demographics of the population were skewed toward highly educated Caucasians.[3] Clearly, these results cannot be easily generalized to patient populations in different geographic locations where socioeconomics features are different.

Cohort

Cohort studies follow a group of people prospectively over time. These studies often follow patients with a specific characteristic and attempt to determine whether the characteristic predicts a particular outcome. These studies can quantify disease incidence and are useful for studying the natural history of a disease process. One of the most important cohort studies ever reported was the Framingham Study, which followed 6,000 individuals with interviews and physician examinations for a 20-year period. It contributed much of what we know about risk factors for the development of coronary artery disease. The duration of a cohort study often depends on the disease process being studied.[4] For a disease process with a long natural history, subjects need to be followed for a longer time.

PHASES OF RESEARCH

Preclinical Studies

Before proceeding to human research, investigators must establish a hypothesis concerning their intervention based on prior data, which often comes from preclinical research. This can include in vitro studies and in vivo animal experiments. This phase of research is tedious, takes an extended amount of time, and often fails to produce results that allow for progression to human studies.

Phase 1 Studies

A phase 1 clinical trial exists to establish the safety of a new treatment. These studies usually involve no more than 50 subjects. Data are collected on administration, dosing, and safety. In phase 1 drug trials, this often consists of increasing the dose to a therapeutic range without producing considerable side effects. Approximately 70% of treatments in this phase will move on to phase 2.[5]

Phase 2 Studies

In phase 2 studies, the investigators are collecting data on the efficacy of the treatment. These studies usually involve several