

INPLASY PROTOCOL

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None declared.

The Association Between Vitamin D and the Components of Male Fertility: a Systematic Review

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Review question / Objective: The purpose of this systematic review is to provide an up-to-date, comprehensive review of the existing literature on the experimental and clinical evidence for the effects of VD on the components of male fertility, sperm parameters and sex hormone production.

Condition being studied: Vitamin D serum level in relation to men semen quality and sex hormones serum concentration.

Eligibility criteria: Exclusion criteria: not in English; review, meta analysis; animal studies; in vitro studies; study group < 30 subject; insufficient data; wrong or missing outcome.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 November 2022 and was last updated on 29 November 2022 (registration number INPLASY2022110151).

INTRODUCTION

Review question / Objective: The purpose of this systematic review is to provide an up-to-date, comprehensive review of the existing literature on the experimental and clinical evidence for the effects of VD on

the components of male fertility, sperm parameters and sex hormone production.

Rationale: Initially, the action of VD was associated mainly with the maintenance of calcium and phosphorus homeostasis, which closely affects the mineralization of the skeleton. However, in recent years, new

knowledge has emerged about its biological function and its relationship to a reduced risk of many chronic diseases. The spectrum of VD's target organs has expanded, and the discovery of vitamin D receptor (VDR) expression and vitamin D metabolizing enzymes (VDME) in the testes, male reproductive tract and human sperm have suggested the reproductive role of VD.

Condition being studied: Vitamin D serum level in relation to men semen quality and sex hormones serum concentration.

METHODS

Search strategy: Review of the literature was conducted using the MEDLINE, Cochrane, and Web of Science databases. The following keywords were used in the search: vitamin D, cholecalciferol, ergocalciferol, vitamin D levels, male fertility, male infertility, semen, sperm, sex hormones, testosterone, estradiol, follicle stimulating hormone, luteinizing hormone, sex hormone binding globulin, inhibin b. During the search, individual keywords and their combinations were typed using AND, OR, or both.

Participant or population: Men from general population or men from infertility clinic.

Intervention: None or vitamin D supplementation.

Comparator: None or placebo group.

Study designs to be included: All published randomized clinical trials, retrospective, prospective, observational and comparative human studies were included.

Eligibility criteria: Exclusion criteria: not in English; review, meta analysis; animal studies; in vitro studies; study group < 30 subject; insufficient data; wrong or missing outcome.

Information sources: Electronic databases.

Main outcome(s): Observational studies: relation between vitamin D levels and semen quality and sex hormones levels. Interventional studies: changes in semen parameters and sex hormones levels after vitamin D supplementation.

Quality assessment / Risk of bias analysis: We applied the recent levels of evidence published by the Center for Evidence-Based Medicine in 2009 to describe the strength and the level of evidence of the results from included studies.

Strategy of data synthesis: Extracted data summarized in the tables.

Subgroup analysis: None.

Sensitivity analysis: None.

Country(ies) involved: Poland.

Keywords: vitamin D; supplementation; male fertility; semen quality; sex hormones.

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