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Prevalence and associated risk factors of cognitive impairment in dialysis patients: a systematic review and meta-analysis

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Corresponding author:
Zhang Xiyou and Luo Yang

1127407012@qq.com

Author Affiliation:
Beijing Shijitan Hospital.

Zhang, XY; Guo, YD; Jia, M; Shi, ZH; Zhang, CX; Zhou, XL; Song, XY; Luo, Y.

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 March 2025 and was last updated on 27 March 2025.

INTRODUCTION

Review question / Objective What is the prevalence and risk factors of cognitive impairment in dialysis patients?

Condition being studied Cognitive impairment has become an important public health problem as the population ages, diabetes and cardiovascular disease prevalence continue to increase. Cognitive impairment prevalence in dialysis patients is relatively higher than those individuals with normal kidney function. Previous studies have linked cognitive impairment with adverse outcomes that can potentially influence dialysis patient's compliance regarding their dialysis schedules and medication regimen.

METHODS

Participant or population Adults undergoing dialysis with cognitive impairment.

Intervention Our review focuses exclusively on elucidating the prevalence and risk factors of cognitive impairment in dialysis patients, without addressing intervention measures.

Comparator Our review may involve a comparative analysis between dialysis patients with cognitive impairment and those without cognitive impairment.

Study designs to be included Cohort and cross-sectional studies.

Eligibility criteria We will include all cohort and cross-sectional studies reporting risk factors for cognitive impairment of people with end-stage kidney disease treated with dialysis. The language used is English or Chinese. Studies must have used a validated measure of cognitive function. Studies must report the prevalence of cognitive impairment and at least one risk factor. We will exclude studies in children (aged <18 years) and animal studies.

Information sources We will select relevant studies published from database inception until now, by searching PubMed, Embase, Cochrane Library and Web of Science. Additionally, we will do manual searches of the reference lists of the included articles and individually identify review articles on the topic to identify additional eligible articles. We will not search the grey literature or conference abstracts.

Main outcome(s) Prevalence and risk factors of cognitive impairment in dialysis patients.

Quality assessment / Risk of bias analysis To assess the quality of included cross-sectional studies, we will use an 11-item criteria which was recommended by the Agency for Healthcare Research and Quality (AHRQ) for assessing risk of bias. We will assess study quality using the Newcastle-Ottawa quality assessment scale (NOS) for cohort studies.

Strategy of data synthesis We will use Stata (version 18.0) for all statistical analyses. Our statistical analysis will include three main components. First, we will do a single-group rates meta-analysis to determine the prevalence of cognitive impairment of patients treated with dialysis. For continuous outcomes, we will report absolute differences between patients with and without cognitive impairment through standardized mean difference (SMD) and 95% confidence interval (CI). For categorical outcomes, we will report pooled estimates of the relative risk through OR and 95% CI. Third, to identify the independent factors associated with cognitive impairment, pooled ORs for risk factors which are explored using multivariate logistic regressions will be calculated.

Subgroup analysis Subgroup analyses for the prevalence of cognitive impairment will be performed by diagnostic instruments, dialysis modality, regions and publication year.

Sensitivity analysis Sensitivity analysis will be conducted using the leave-one-out method, which involves iteratively excluding individual studies, re-performing the meta-analysis, and evaluating changes in pooled effect size and heterogeneity metrics.

Language restriction English or Chinese.

Country(ies) involved China.

Keywords dialysis; cognitive impairment; prevalence; risk factor.

Contributions of each author

Author 1 - Xiyou Zhang.
Email: 1127407012@qq.com
Author 2 - Yidan Guo.
Author 3 - Meng Jia.
Author 4 - Zhihua Shi.
Author 5 - Chunxia Zhang.
Author 6 - Xiaoling Zhou.
Author 7 - Xinyu Song.
Author 8 - Yang Luo.