INPLASY PROTOCOL

To cite: Yang et al. Effect of diabetes on post-stroke recovery: A systematic narrative review. Inplasy protocol 2021110032. doi: 10.37766/inplasy2021.11.0032

Received: 10 November 2021

Published: 10 November 2021

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Support: **None.**

Review Stage at time of this submission: **Data analysis - Completed but not published.**

Conflicts of interest:
None declared.

Effect of diabetes on post-stroke recovery: A systematic narrative review

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Review question / Objective: **Patients with stroke often have comorbid diabetes. Considering its detrimental effects on brain function, diabetes may increase the risk of poor recovery. The aim of this review was to investigate the effects of diabetes on post-stroke recovery.**
Condition being studied: **Among multiple risk factors for stroke development, diabetes mellitus (DM) is a major risk factor for stroke, and approximately 20%–33% of patients with acute stroke have comorbid diabetes. In patients with diabetes, inefficient glucose metabolism may cause negative impact on brain metabolism and function. Considering the detrimental effects of diabetes on brain function, it is postulated that diabetes impairs cortical plasticity and neural recovery after stroke. Stroke patients often suffer from residual impairment of function and difficulties in performing activities of daily living (ADL). Among common causes of ADL limitations, which include older age, fractures, and heart disease, diabetes also causes ADL limitations, which may result in poor overall recovery after stroke. To date, the effect of diabetes on post-stroke recovery remains unclear. Thus, the aim of this review was to investigate the effects of diabetes on post-strokerecovery.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 November 2021 and was last updated on 10 November 2021 (registration number INPLASY2021110032).

INTRODUCTION

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Condition being studied: Among multiple risk factors for stroke development, diabetes mellitus (DM) is a major risk factor for stroke, and approximately 20%–33% of patients with acute stroke have comorbid diabetes. In patients with diabetes, inefficient glucose metabolism may cause negative impact on brain metabolism and function. Considering the detrimental effects of diabetes on brain function, it is postulated that diabetes impairs cortical plasticity and neural recovery after stroke. Stroke patients often suffer from residual impairment of function and difficulties in performing activities of daily living (ADL). Among common causes of ADL limitations, which include older age, fractures, and heart disease, diabetes also causes ADL limitations, which may result in poor overall recovery after stroke. To date, the effect of diabetes on post-stroke recovery remains unclear. Thus, the aim of this review was to investigate the effects of diabetes on post-stroke recovery.

METHODS

Search strategy: We searched the PubMed, SCOPUS, Embase, and Cochrane Library databases for relevant studies published until May 26, 2021. To identify potentially relevant articles, combinations of the following key search phrases were used: "stroke," "diabetes," "outcomes," "recovery," "cognition," "cognitive impairment," "memory," "motor," and "recovery outcomes.".

Participant or population: Acute stroke including ischemic or hemorrhagic strokes, patients diagnosed with either T1DM or T2DM.

Intervention: No specific intervention has been established.

Comparator: No specific comparator has been established.

Study designs to be included: Also, this review was limited to human studies, i.e., animal studies were not included; moreover, review articles, commentaries, letters, and case reports that did not present original data were also excluded.

Eligibility criteria: The following inclusion criteria were applied for the selection of articles: 1) enrollment of patients with acute stroke including ischemic or hemorrhagic strokes, 2) patients diagnosed with either T1DM or T2DM, and 3) examination of the impact of diabetes on recovery, including specific domains, such as ADL, motor improvement, cognitive improvement, and QOL. Subtypes of stroke included both ischemic and hemorrhagic stroke.

Information sources: We searched the PubMed, SCOPUS, Embase, and Cochrane Library databases.

Main outcome(s): Of 29 studies that assessed ADL recovery after stroke, 22 studies suggested that diabetes had a negative effect on recovery of ADL after stroke. Regarding motor recovery, only one out of four studies showed that diabetes had some effect on motor recovery after stroke. Of the two studies on cognitive recovery, one reported that diabetes was an independent predictor of poor cognitive recovery after stroke. Three studies on QOL reported that a poor QOL after stroke was associated with the presence of diabetes. In the included studies, recovery of ADL after stroke was assessed using the following assessment tools: modified Rankin scale (mRS), functional independence measure (FIM), modified Barthel index (MBI). Other aspects of post-stroke recovery were assessed using the following tools. Motor recovery was assessed using the Fugl-Meyer assessment (FMA) scale, motricity index (MI), modified Brunnstrom classification (MBC), and functional ambulation category (FAC). Cognitive recovery was assessed using the mini-mental state examination (MMSE), which includes tests of orientation, memory, language, and attention. The health-related quality of life (QOL) was evaluated using the Medical Outcomes Study 36-Item short-form (SF-36) health survey and stroke-specific QOL scores.

Quality assessment / Risk of bias analysis: The methodological quality of the included studies was assessed using the Newcastle-Ottawa scale (NOS), which comprises the following three aspects: selection of subjects, comparability of groups, and assessment of outcome. The quality of each study was graded as low (0-3), moderate (4-6), or high (7-9).

Strategy of data synthesis: Two examiners (SY, MC) carried all aspects of title selection, data extraction and analyses, independently. Any disagreements were resolved through discussion.

Subgroup analysis: Not applicable.

Sensitivity analysis: Not applicable.

Language: English.

Country(ies) involved: Republic of Korea.

Keywords: diabetes; stroke; recovery; function; outcome.

Contributions of each author:

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