INPLASY

Effect of Preoperative Anxiety and Depression on Surgical Outcomes for Degenerative Cervical Myelopathy

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ADMINISTRATIVE INFORMATION

Support - N/A.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202490118

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 September 2024 and was last updated on 26 September 2024.

INTRODUCTION

*R*eview question / Objective To determine if preoperative anxiety and/or depression is associated with poor surgical outcomes for degenerative cervical myelopathy.

Rationale Degenerative Cervical Myelopathy (DCM) is the leading cause of cervical spine dysfunction and is associated with significant morbidity.[1,2] Notably, this degenerative spine condition is associated with significantly increased rates of depression and anxiety.[3] This may be due to unstable and prolonged disease courses prior to treatment, with a potentially wide range of symptoms from minor numbness to complete functional disability. Depression and anxiety in patients with DCM may lead to delayed treatment of spine pathologies and may also lead to poor post-operative wound care and adherence to physical rehabilitation regimens.[4,5]

Surgical intervention is a popular highly effective method of treating DCM. However, depression and anxiety have been associated with poor surgical outcomes in the spine surgery population.[6-9] Though treatment methodology improves and understanding of disease processes advance, it remains unclear the psychosocial aspects that may affect post-operative outcomes in the spine population. However, to our knowledge, no systematic review and meta-analysis has been conducted to ascertain the effects of pre-operative depression or anxiety on surgical outcomes in the degenerative cervical myelopathy population.

We seek to perform a systematic review of the literature for any prospective, retrospective, or RCT studies that investigated the effect of pre-operative depression and anxiety on surgical outcomes for DCM and to perform a meta-analysis of these results. In doing so, we hope to better understand the true effect of depression and anxiety on DCM surgical outcomes.

Condition being studied Degenerative Cervical Myelopathy (DCM) is the leading cause of cervical

spine dysfunction and is associated with significant morbidity and disease burden. Surgical intervention through decompression with/without fusion are highly effective and commonly performed. However, the role that depression and anxiety play in post-operative outcomes in DCM remain unclear.

METHODS

Search strategy
Embase:

'depression'/exp OR 'anxiety'/exp OR 'anxiety disorder'/exp OR depress*:ti,ab,kw OR anxiet*:ti,ab,kw OR anxious:ti,ab,kw OR 'posttraumatic stress':ti,ab,kw OR 'post traumatic stress':ti,ab,kw OR ptsd:ti,ab,kw OR 'mental health*':ti,ab,kw OR psychiatr*:ti,ab,kw OR psychology*:ti,ab,kw

'degenerative cervical myelopathy'/exp OR 'cervical myelopathy'/exp OR 'cervical spondylosis'/exp OR ((cervical NEAR/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis)):ti,ab,kw)

Medline:

(exp Spondylosis/ or Spinal Stenosis/) and cervical.ti,ab,kw.

(cervical adj3 (myelopath* or stenosis or spondylosis or spondylolysis or spondylolisthesis)).ti,ab,kw.

Depression/ or exp Depressive Disorder/ or exp Anxiety/ or exp Anxiety Disorders/ or exp Stress Disorders, Traumatic/

(depress* or anxiet* or anxious or posttraumatic-stress or post-traumatic-stress or PTSD or mental-health* or psychiatr* or psychology*).ti,ab,kw.

Web of Science:

((TI=((cervical NEAR/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis)))) OR AB=((cervical NEAR/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis)))) OR AK=((cervical NEAR/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis)))

((TI=((depress* OR anxiet* OR anxious OR posttraumatic-stress OR post-traumatic-stress OR PTSD OR mental-health* OR psychiatr* OR psychology*))) OR AB=((depress* OR anxiet* OR anxious OR posttraumatic-stress OR post-traumatic-stress OR PTSD OR mental-health* OR psychiatr* OR psychology*))) OR AK=((depress* OR anxiet* OR anxious OR posttraumatic-stress OR post-traumatic-stress OR PTSD OR mental-health* OR psychiatr* OR psychology*))

Scopus:

TITLE-ABS-KEY (cervical W/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis))

TITLE-ABS-KEY (depress* OR anxiet* OR anxious OR posttraumatic-stress OR post-traumatic-stress ORptsd OR mental-health* OR psychiatr* OR psychology*)

(TITLE-ABS-KEY (cervical W/2 (myelopath* OR stenosis OR spondylosis OR spondylolysis OR spondylolisthesis)))AND (TITLE-ABS-KEY (depress* OR anxiet* OR anxious OR posttraumatic-stress OR post-traumatic-stress ORptsd OR mental-health* OR psychiatr* OR psychology*)) AND (LIMIT-TO (LANGUAGE , "english")) AND (EXCLUDE (DOCTYPE , "le") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "no"))

Participant or population Adult patients (>18) with degenerative cervical myelopathy and underwent surgical treatment

Intervention Pre-operative depression and/or anxiety

Comparator Patients with preoperative depression and/or anxiety compared to those without

Study designs to be included Observational studies, RCTs

Eligibility criteria Study exclusion criteria: Case reports, pilot reports, opinion pieces, theses, conference proceedings, letters, editorials, meta-analysis, reviews, surgical technique papers, abstracts, presentations, and non-english language publications without translation.

Information sources Medline, Embase, Web of Science, Scopus.

Main outcome(s) Primary
Standardized Mean Difference (SMD):
Change in mJOA, NDI, or composite

Additional outcome(s) OR for complications, readmissions, PROs such as Nurick, ODI, SF-36PCS, and mental health measures.

Rationale for outcomes:
The selected outcome measures are all some of the most commonly reported patient reported outcomes (PROs) that capture degree of disability, pain, and quality of life related to spine pain.[10-12]

Data management Articles selected will be stored in Covidence for screening of studies. Data extraction will be conducted via a standardized spreadsheet.[13]
Selection process:
Two independent reviewers will assess remaining articles for relevance first based on titles and abstracts, and then will assess full-text articles for eligibility. Any disagreements between reviewers will be resolved in both phases by either consensus or by a third reviewer. Each selected study will be distributed to one of the authors for extraction. We anticipate no effort needed to contact authors of selected studies to obtain patient level data.

Quality assessment / Risk of bias analysis Risk of bias will be determined for each study via the ROBINS-I tool.[14] Quality will also be addressed by assessing compliance to research reporting guidelines such as STROBE.[15] Competing interests in each study will be noted if any author had ties to industry particularly those funded by an industry sponsor.

Strategy of data synthesis We expect variability in patient selection among the studies. Therefore, we plan on using a random-effects model with restricted maximum-likelihood estimation (REML) to perform the meta-analysis. We will utilize standardized mean difference (SMD) and raw mean differences (RMD) for pooled analysis of continuous outcome variables. We plan on using an inconsistency index (I2) to assess for heterogeneity. We will also be calculating the mean difference in survival between treatment groups. All statistical analyses were performed using R (version 4.3.1).[16] Packages utilized will include the meta package.[17] Alpha will be set at 0.05 and all test of significance will be 2-sided. Data and syntax used for the analysis will be made publicly available through GitHub.

Subgroup analysis Separations based on anxiety AND depression, anxiety ALONE, or depression ALONE

Sensitivity analysis We will perform a sensitivity analysis via the leave-one-out method and Copas-like selection model.[18] Statistical heterogeneity and the magnitude of heterogeneity will be assessed using Cochran χ2 tests and the I2 statistic, respectively. Publication bias will be assessed using the Egger test and visually using funnel plots.[19]

Language restriction English

Country(ies) involved United States

Other relevant information N/A.

Keywords DCM, Depression, Anxiety.

Dissemination plans Publication in peer-reviewed journal

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