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Study Protocol

Management and outcomes of sellar, suprasellar and parasellar masses in low- and middle-income countries: a scoping review protocol

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Abstract

Sellar, suprasellar or parasellar masses refer to space-occupying lesions that arise from the area surrounding the pituitary gland and many other vital structures, which can impact quality of life if damaged. Therefore, optimal management by a multidisciplinary team, which includes neurosurgeons, would be required to ensure that patients receive timely intervention to prevent long-term co-morbidities. The landscape of management of these masses in high-income countries are well described in the literature, however, there is a lack of clarity in the counterpart low- and middle-income countries, thus necessitating an evaluation of the literature. This protocol outlines how we will conduct our scoping review on the topic of interest. MEDLINE, Embase, Global Index Medicus and African Journals Online will be searched from year 2000 to date in order to identify the relevant studies. Patients with a sellar, suprasellar or parasellar masses managed in an LMIC will be included. Surgical, medical and conservative management of the relevant masses will be considered. Articles in English and French will be included. Primary outcome will describe the management of sellar, suprasellar, or parasellar masses in LMICs. Secondary outcomes will include describing the epidemiology, presentation and outcomes of patients with sellar, suprasellar or parasellar masses. This scoping review will be the first to evaluate the current landscape of the management and outcomes of sellar, suprasellar and parasellar masses in LMICs, highlighting important themes that may be used to guide further research as well as health system strengthening efforts by policymakers, governments and stakeholders.

INTRODUCTION

Sellar masses are space-occupying lesions that arise from the pituitary gland or its surrounding structures [1]. According to their size and extension and function (if any, for both), patients with sellar masses may present with a range of symptoms such as headache, vision loss and features of hormonal dysfunction (hyperp0ituitarism or hypopituitarism) [2].

Similarly, the parasellar region describes the surrounding area of the sella turcica. It is an anatomically and surgically challenging area due to its close proximity and crossroads of crucial

adjacent structures [3, 4]. The region is limited bilaterally by the cavernous sinuses on both sides of the sella turcica, by the optic chiasm superiorly and by the sphenoidal sinus inferiorly. On the other hand, suprasellar masses refer to lesions that affect areas superior to the pituitary gland and the optic nerves. These different sellar regions are usually difficult to delineate from one another due to close proximity between the structures located in the surroundings of the pituitary gland [5]. Moreover, structures such as the meninges, blood vessels and the hypothalamic–pituitary system surround the area, however, with poor delineation, therefore lesions developing from these structures can also present with a range of symptoms similar to that of those in the sellar region [6].

While several studies have reported the epidemiological characteristics, diagnostic innovations, management options and outcomes of care of these masses in high-income countries (HICs) [7–11], there is a paucity in the literature on the diagnosis, management and outcomes of the masses from the low- and middle-income countries (LMICs), except for small studies describing the experience from tertiary centres [12–16]. This presents the question: How are patients with sellar, suprasellar and parasellar masses managed in LMICs? To our knowledge, there have yet to be studies evaluating the management and outcomes of these patients in LMICs, hence necessitating the need for a review of the literature.

We will conduct a scoping review instead of a systematic review because the evidence relating to the epidemiology, presentation, management and outcomes of patients with sellar, suprasellar and parasellar masses in LMICs has not been comprehensively reviewed. Systematic reviews answer focused research questions following the Population, Intervention, Comparator/Control, Outcome framework, whereas scoping reviews can explore several questions in a broad sense. Given our interest in the epidemiology, presentation, management and outcomes of these masses, a scoping review is, therefore, more suitable for our investigation.

Primary aim

Identify the treatment modalities and management plans available (e.g. conservative management, surgery and use of specialist therapy) in managing sellar, suprasellar and parasellar masses in LMICs.

Secondary aims

1. Assess the clinical outcomes defined as rates of complications, morbidity and mortality among patients with sellar, suprasellar and parasellar masses in LMICs.
2. Assess the epidemiology of sellar, suprasellar and parasellar masses in different LMICs.
3. Assess the availability of diagnostic modalities such as neuroimaging (magnetic resonance imaging and computed tomography scan).

METHODS AND ANALYSIS

The scoping review will be conducted as per the Arksey and O'Malley framework [17] and will be reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Extension for Scoping Reviews guidelines [18].

This protocol has been reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols guidelines [19].

Eligibility criteria
Inclusion criteria

All relevant documents published in a peer-reviewed journal that discusses the epidemiology, presentation, management and outcomes of sellar, suprasellar and parasellar masses in LMICs will be included. LMICs will be defined using the World Bank Criteria based on the 2021/2022 fiscal year [20]. Study types, including trials, case reports, case series and cohort studies and audits, will be included. Only publications in English and French were considered.

Exclusion criteria

The following articles were considered as outside the scope of this work and will be excluded:

1. Articles that do not include LMIC patients or do not have disaggregated data about the LMIC population.
2. Articles that do not discuss or do not have disaggregated data about sellar, suprasellar and parasellar masses.
3. Articles that do not discuss epidemiology, presentation, management or outcomes of patients with sellar, suprasellar and parasellar masses.
4. Articles that are neither written in English nor French.
5. Conference abstracts (due to the lack of in-depth information available), reviews, meta-analyses and qualitative studies. Opinion pieces and editorials.

Information sources

A literature search will be run on the following databases: MEDLINE (Ovid), Embase (Ovid), Global Index Medicus and African Journals Online.

Search strategy

The search strategy adapted for all electronic databases can be found in the Supplementary file. Studies were found using the following Medical Subject Heading terms and Boolean operators: ('sellar mass' OR 'parasellar mass' OR 'suprasellar mass' OR 'pituitary') AND ('neoplasm' OR 'lesion' OR 'cancer' OR 'tumour') AND ('outcomes' OR 'management' OR 'diagnosis' OR 'conservative' OR 'radiosurgery'). A search filter was set to only show publications from 2000 and 2021.

Data management

Data records will be downloaded from the respective databases in comma-separated values formatted files. They will then be imported into Rayyan [21] where deduplication, title and abstract screening and full-text screening will take place. Further data extraction and quality assessment will be carried out on Microsoft Excel (Microsoft, Richmond, VA, USA).

Study selection

All identified articles from the search will be transferred to Rayyan to facilitate de-duplication. Each study will then be screened using title and abstract, by two independent reviewers, against the pre-defined inclusion and exclusion criteria. Potentially eligible studies will be further screened for full-text review. If any disagreements occur, an attempt will be made to resolve this between the two review authors who initially screened the article. If a consensus cannot be reached, a senior author will be consulted for clarification. If any data were not present or available in the articles identified, corresponding authors will be contacted via email to request the data.

Data extraction

Full-text screened articles will be exported into a previously made data extraction proforma on Microsoft Excel (Microsoft). Data will be extracted on (i) study design, (ii) patient demographics, (iii) country of origin, (iv) mass characteristics, (v) neuroimaging modality used, (vi) type of intervention, (vii) outcomes of care and (viii) complications. Data extraction will be performed in two stages, a pilot stage followed by a proper stage. The pilot stage will consist of having multiple authors, each going through the same 10 randomly selected articles to extract data. This is to assure the reliability of the proforma and that all participant authors were able to extract data accurately and homogeneously. Feedback from the pilot stage will inform any necessary changes to be made, upon discussion, in order to accurately capture the pertinent themes in the literature.

Data synthesis

Study characteristics will be summarized using descriptive statistics and will be presented in a table. Data relating to study characteristics will be grouped into categories where appropriate. Categorization might be based on the type of mass, LMICs or will be finalized in discussions with the team wherever necessary if notable differences emerge in study findings.

Characteristics of the study population will be reported; this includes age, study setting and the country being studied. Characteristics of the mass, such as relevant biochemistry, location of mass and size of mass at presentation, discharge and follow-up, will be noted. Neuroimaging modalities used to diagnose the masses will also be reported. Types of conservative, hormonal therapy, chemotherapy, radiotherapy and operative approaches (including type of approach) to the masses will be highlighted. The treatment outcomes will be described: mortality rates, overall survival, progression-free interval, recurrence-free, functional outcomes, length of hospital admission, follow-up interval and short- and long-term complications. An analysis of these outcomes will enable comparison and discussion of effectiveness of treatment techniques adopted in LMICs with HICs as well as within LMICs.

Limitations

There is an extensive amount of literature published in Mandarin Chinese, Arabic, Russian, Spanish, Portuguese, Hindi and Bengali, which will not be addressed by this review. Governmental reports and articles from non-peer-reviewed journals may also contain valuable data that will not be reported in this review.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *JOSPRM Journal* online.

AUTHORS' CONTRIBUTIONS

A.E. and D.U.D. contributed to the conception and design of the study. A.E., D.U.D. and S.Z.Y.O. drafted the manuscript. All authors revised the manuscript critically for important intellectual content and approved for the manuscript to be published. A.E., D.U.D. and S.Z.Y.O. contributed equally and are the joint first authors.

CONFLICT OF INTEREST STATEMENT

None declared.

ETHICS AND DISSEMINATION

This study will exclusively involve secondary data collection and no human participants will be involved in the design or dissemination of this research; hence, ethical approval is not required. The results from this study will be disseminated through a peer-reviewed journal.

FUNDING

REFERENCES

1. Hodler J, Kubik-Huch RA, von Schulthess GK, Eds. *Diseases of the Brain, Head and Neck, Spine 2020–2023: Diagnostic Imaging*. Switzerland: Springer International Publishing, 2020.
2. Molitch ME. Diagnosis and treatment of pituitary adenomas: a review. *JAMA* 2017;**317**:516–24.
3. Ruscalleda J. Parasellar lesions. *Eur Radiol* 2005;**15**:549–59.
4. Gatto F, Perez-Rivas LG, Olarescu NC, Khandeva P, Chachlaki K, Trivellin G, *et al.* Diagnosis and treatment of parasellar lesions. *Neuroendocrinology* 2020;**110**:728–39.
5. Kucharczyk W, Truwit CL. Diseases of the Sella Turcica and Parasellar Region. In: Hodler J, Kubik-Huch RA, von Schulthess GK (eds). *Diseases of the Brain, Head and Neck, Spine 2020–2023: Diagnostic Imaging*. Switzerland: Springer, 2020, http://www.ncbi.nlm.nih.gov/books/NBK554348/
6. Kaltsas GA, Evanson J, Chrisoulidou A, Grossman AB. The diagnosis and management of parasellar tumours of the pituitary. *Endocr Relat Cancer* 2008;**15**:885–903.
7. Daly AF, Rixhon M, Adam C, Dempegioti A, Tichomirowa MA, Beckers A. High prevalence of pituitary adenomas: a cross-sectional study in the province of Liege, Belgium. *J Clin Endocrinol Metab* 2006;**91**:4769–75.
8. Fernandez A, Karavitaki N, Wass JAH. Prevalence of pituitary adenomas: a community-based, cross-sectional study in Banbury (Oxfordshire, UK). *Clin Endocrinol (Oxf)* 2010;**72**: 377–82.
9. Raappana A, Koivukangas J, Ebeling T, Pirilä T. Incidence of pituitary adenomas in northern Finland in 1992-2007. *J Clin Endocrinol Metab* 2010;**95**:4268–75.
10. Gruppetta M, Mercieca C, Vassallo J. Prevalence and incidence of pituitary adenomas: a population based study in Malta. *Pituitary* 2013;**16**:545–53.
11. Agustsson TT, Baldvinsdottir T, Jonasson JG, Olafsdottir E, Steinthorsdottir V, Sigurdsson G, *et al.* The epidemiology of pituitary adenomas in Iceland, 1955-2012: a nationwide population-based study. *Eur J Endocrinol* 2015;**173**:655–64.
12. Al-Futaisi A, Saif A-Y, Al-Zakwani I, Al-Qassabi S, Al-Riyami S, Wali Y. Clinical and epidemiological characteristics of pituitary tumours using a web-based pituitary tumour registry in Oman. *Sultan Qaboos Univ Med J* 2007;**7**:25–30.
13. Hussein SH, Wahedi TS, Johani NA, Hakami YA, Alzahrani K, AlMalki MH. Clinical and epidemiological characteristics of pituitary tumours in a single centre in Saudi Arabia. *Hormones (Athens)* 2018;**17**:261–7.
14. Mansour AA, Alhamza AHA, Almomin AMSA, Zaboon IA, Alibrahim NTY, Hussein RN, *et al.* Spectrum of pituitary disorders: a retrospective study from Basrah. *Iraq F1000Research* 2018;**7**:430.

15. Khamseh ME, Mohajeri Tehrani MR, Mousavi Z, Malek M, Imani M, Hoshangian Tehrani N, *et al.* Iran pituitary tumor registry: description of the program and initial results. *Arch Iran Med* 2017;**20**:746–51.

16. Aljabri KS, Bokhari SA, Assiri FY, Alshareef MA, Khan PM. The epidemiology of pituitary adenomas in a community-based hospital: a retrospective single center study in Saudi Arabia. *Ann Saudi Med* 2016;**36**:341–5.

17. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol Theory Pract* 2005;**8**:19–32.

18. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, *et al.* PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;**169**:467–73.

19. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, *et al.* Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;**4**:1.

20. The World Bank Group. *World Bank Country and Lending Groups.* (n.d.). https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (30 June 2021, date last accessed).

21. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan — a web and mobile app for systematic reviews systematic reviews. *Syst Rev* 2016;**5**:210.