INPLASY PROTOCOL

To cite: Soundararajan et al. GAZE EVOKED TINNITUS (GET) POST SURGICAL EXCISION OF VESTIBULAR SCHWANNOMA: A SCOPING REVIEW PROTOCOL. Inplasy protocol 202340024. doi: 10.37766/inplasy2023.4.0024

Received: 08 April 2023

Published: 08 April 2023

Corresponding author:
Sathveeka Kasthurisamy Soundararajan

sathveeka.kasthurisamysoundararajan@postgrad.manchester.ac.uk

Author Affiliation:
The University of Manchester

Support: **NIHR.**

Review Stage at time of this submission: **Formal screening of search results against eligibility criteria.**

Conflicts of interest:
None declared.

GAZE EVOKED TINNITUS (GET) POST SURGICAL EXCISION OF VESTIBULAR SCHWANNOMA: A SCOPING REVIEW PROTOCOL

Soundararajan, SK[1]; Almufarrij, I[2]; Hoseinabadi, R[3]; Munro, KJ[4].

Review question / Objective: **The aim of this scoping review is to collate and catalogue what has been published on the symptom of Gaze-Evoked Tinnitus (GET) after surgery for removal of a Vestibular Schwannoma (VS).**
Eligibility criteria: **The inclusion and exclusion criteria for studies are reported in accordance with Participant, Intervention, Comparator and Outcome (PICO) elements. Participant or Population: Adults with GET after surgical removal of VS. Intervention: The Intervention of interest will be surgical removal of the VS. Comparator: There will be no comparator. Outcomes: All outcomes including pathophysiology, neural basis, incidence & prevalence, diagnosis and treatment strategy of GET after surgical removal of VS. Study designs to be included: All primary research publications, irrespective of their type of design, will be eligible for inclusion. Studies/articles which are available only in English language will be included. Theses, conference abstracts and chapters from books will be included.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 April 2023 and was last updated on 08 April 2023 (registration number INPLASY202340024).

INTRODUCTION

Review question / Objective: **The aim of this scoping review is to collate and catalogue what has been published on the symptom of Gaze-Evoked Tinnitus (GET) after surgery for removal of a Vestibular Schwannoma (VS).**

Background: **Eighth nerve contains 2 groups of fibres supplying cochlea and vestibular apparatus, hence it is called as**

vestibulocochlear nerve (Hodes et al., 1949). VS are believed to be derived from myelination of Schwann cells of the vestibular nerve fibres of the eighth cranial nerve. These tumours are the most common neoplasm of cerebellopontine angle (CPA) and account for 8% of all intracranial tumours (Carlson & Link, 2021). The most common symptoms include sensorineural hearing loss, imbalance, dizziness and tinnitus (Carlson et al., 2014). Common treatments for VS include MRI observation, stereotactic radiosurgery, fractionated radiotherapy, and microsurgery (Arthurs et al., 2011). Post-surgical excision of the VS results in hearing loss, tinnitus, vertigo, headache and unsteadiness (Myrseth et al., 2007). GET may also occur after surgical removal of the VS (Biggs & Ramsden, 2002).

GET is a phenomenon where horizontal or vertical deviation of eyes from the neutral position results in tinnitus in tumour resected ear (Biggs & Ramsden, 2002). Cochlear deafferentation and cortical maladaptation are believed to cause GET (Tunkel et al., 2014; Biggs & Ramsden, 2002). Even though this condition has been observed to occur more frequently than previously thought, its pathophysiology is still not fully understood (Biggs & Ramsden, 2002).

Case studies and publications investigating the pathophysiology of this condition exist. In some cases of GET jaw movement such as clenching teeth modulates the quality of the tinnitus (Coad et al., 2001). There are only a few published studies on the characteristics and prevalence of GET. Collating and presenting all the published evidences on the symptoms of the GET will address the gap in knowledge that exist.

Rationale: Pathophysiology of GET is not clearly understood, so there exists a gap in knowledge about GET's actual occurrence. The aim of this review is to provide a synthesis of the evidence in the literature with respect to GET for VS, with a view to informing future studies in this area e.g. assessment and management strategies on GET. To date, no scoping review has been performed to collate the evidence.

METHODS

Strategy of data synthesis: METHODS - The Scoping review's methods are reported in accordance with Preferred Reporting Items for Systematic Review and meta-analyses-extension for Scoping reviews (PRISMA-ScR; Tricco et al., 2018).

Search strategy: The following databases and search engines will be systematically searched to identify relevant studies which meets the eligibility criteria - Medline (via PubMed), Academic Search Premier, EMcare, EMBASE (Ovid), Google Scholar, Cochrane library and web of science. The reference lists in the eligible studies will be screened to check for any other relevant published work. No search filters with respect to publication date, type and status will be taken into consideration. The review team has developed the search protocol in consultation with a medical information specialist. The search strategy consists of controlled terms (e.g., medical Subject headings) and free text words, where appropriate. An iterative process was conducted to test the proposed strategies.

(("Gaze evoked tinnitus"[tw] OR "Somatic tinnitus"[tw] OR "Somatosensory tinnitus"[tw] OR "gaze modulated tinnitus"[tw] OR "Gaze evoked tinnitus"[title/abstract] OR "Somatic tinnitus"[title/abstract] OR "Somatosensory tinnitus"[title/abstract] OR "gaze modulated tinnitus"[title/abstract] OR "Gaze tinnitus"[title/abstract]) AND ("Vestibular schwannoma"[tw] OR "Vestibular schwannomas"[tw] OR "Vestibular schwannoma*"[tw] OR "cochleovestibular schwannoma"[tw] OR "cochleovestibular schwannomas"[tw] OR "cochleovestibular schwannoma*"[tw] OR "Acoustic Neuroma"[tw] OR "Acoustic Neuromas"[tw] OR "Acoustic Neuroma*"[tw] OR "Neuroma, Acoustic"[mesh] OR "acoustic neurilemmoma"[tw] OR "acoustic neurilemmomas"[tw] OR "acoustic neurilem*"[tw] OR "vestibular neurilemmoma"[tw] OR "vestibular neurilemmomas"[tw] OR "vestibular neurilem*"[tw] OR "acoustic tumor"[tw] OR "acoustic tumors"[tw] OR "acoustic tumor*"[tw] OR "angle tumor"[tw] OR

"angle tumors"[tw] OR "angle tumor*"[tw] OR "acoustic tumour"[tw] OR "acoustic tumours"[tw] OR "acoustic tumour*"[tw] OR "angle tumour"[tw] OR "angle tumours"[tw] OR "angle tumour*"[tw] OR "Cerebellopontine angle tumor"[tw] OR "Cerebellopontine angle tumors"[tw] OR "Cerebellopontine angle tumor*"[tw] OR "Cerebellopontine angle tumour"[tw] OR "Cerebellopontine angle tumours"[tw] OR "Cerebellopontine angle tumour*"[tw] OR "Cerebellopontine angle"[tw] OR "Cerebellopontine angles"[tw] OR "Cerebellar pontine angle tumor"[tw] OR "Cerebellar pontine angle tumors"[tw] OR "Cerebellar pontine angle tumor*"[tw] OR "Cerebellar pontine angle tumour"[tw] OR "Cerebellar pontine angle tumours"[tw] OR "Cerebellar pontine angle tumour*"[tw] OR "Cerebellar pontine angle"[tw] OR "Cerebellar pontine angles"[tw] OR "Vestibular schwannoma"[title/abstract] OR "Vestibular schwannomas"[title/abstract] OR "cochleovestibular schwannoma"[title/abstract] OR "cochleovestibular schwannomas"[title/abstract] OR "Acoustic Neuroma"[title/abstract] OR "Acoustic Neuromas"[title/abstract] OR "acoustic neurilemmoma"[title/abstract] OR "acoustic neurilemmomas"[title/abstract] OR "vestibular neurilemmoma"[title/abstract] OR "vestibular neurilemmomas"[title/abstract] OR "acoustic tumor"[title/abstract] OR "acoustic tumors"[title/abstract] OR "angle tumor"[title/abstract] OR "angle tumors"[title/abstract] OR "acoustic tumour"[title/abstract] OR "acoustic tumours"[title/abstract] OR "angle tumour"[title/abstract] OR "angle tumours"[title/abstract] OR "Cerebellopontine angle tumor"[title/abstract] OR "Cerebellopontine angle tumors"[title/abstract] OR "Cerebellopontine angle tumour"[title/abstract] OR "Cerebellopontine angle tumours"[title/abstract] OR "Cerebellopontine angle"[title/abstract] OR "Cerebellopontine angles"[title/abstract] OR "Cerebellar pontine angle tumor"[title/abstract] OR "Cerebellar pontine angle tumors"[title/abstract] OR "Cerebellar pontine angle tumour"[title/abstract] OR "Cerebellar pontine angle tumours"[title/abstract] OR "Cerebellar pontine angle"[title/abstract] OR "Cerebellar pontine angles"[title/abstract]))

Data synthesis: 1st and 2nd authors will independently extract the data from all of the eligible studies. Differences of opinion will be resolved in discussion with the 3rd author. The data will be extracted to a pre-designed extraction form. These data will be reported narratively.

Eligibility criteria: The inclusion and exclusion criteria for studies are reported in accordance with Participant, Intervention, Comparator and Outcome (PICO) elements.

Participant or Population: Adults with GET after surgical removal of VS.

Intervention: The Intervention of interest will be surgical removal of the VS.

Comparator: There will be no comparator.

Outcomes: All outcomes including pathophysiology, neural basis, incidence & prevalence, diagnosis and treatment strategy of GET after surgical removal of VS.

Study designs to be included: All primary research publications, irrespective of their type of design, will be eligible for inclusion. Studies/articles which are available only in English language will be included. Theses, conference abstracts and chapters from books will be included.

Source of evidence screening and selection: Information sources: Electronic databases and Search engines. The following databases and Search engines will be systematically searched to identify relevant studies which meet the eligibility criteria - Medline (via PubMed), Academic Search Premier, EMcare, EMBASE (Ovid), Google Scholar, Cochrane library and Web of science.

Selection process: The Title/abstract of all the identified studies will be screened by the 1st author to determine if they meet the eligibility criteria. A proportion of identified eligible studies (50 percentage) will be screened independently by the 2nd author. Differences of opinion will be resolved in discussion with the 3rd author. According to PRISMA guidelines, a flow chart will be

presented to explain the inclusion and exclusion.

Data management: SEARCH RECORDS Data management: All the references will be transferred to the Endnote application software. Endnote reference management software will be used to keep track of records and to remove duplicates. Once the duplications are removed, references will then be transferred to an online platform (e.g. Rayyan or Covidence) for manual eligibility screening.

Reporting results / Analysis of the evidence: Quality assessment / Risk of bias analysis: No risk of bias assessment will be carried out as this is a scoping review. Subgroup analysis: Not Applicable. Sensitivity analysis: Not Applicable.

Presentation of the results: According to PRISMA guidelines, a flow chart will be presented to explain the inclusion and exclusion of the studies/articles. Then, The data will be extracted to a pre-designed extraction form. These data will be reported narratively.

Language restriction: Studies/articles which are available only in English language will be included.

Country(ies) involved: United Kingdom, Saudi Arabia.

Keywords: Gaze Evoked Tinnitus, Vestibular Schwannoma, Cerebellopontine Angle tumours, somatic tinnitus.

Dissemination plans: Ethical approval: This scoping review will solely extract and analyse data from previously published studies, hence no ethical approval will be solicited.
Dissemination plans: The scoping review results will be presented at an appropriate scientific conference and will be published in a peer-reviewed academic journal.

Contributions of each author:
Author 1 - Sathveeka Kasthurisamy Soundararajan. - The author developed and prepared the review protocol and will contribute to the selection and data extraction processes. The author will also prepare the manuscript of this review.
sathveeka.kasthurisamysoundararajan@postgrad.manchester.ac.uk
Author 2 - Ibrahim Almufarrij - The author contributed to the development of the review protocol and will also contribute to the selection and data extraction processes. The author will also critically review the manuscript of this review.
ialmufarrij@ksu.edu.sa
Author 3 - Reza Hoseinabadi - The author contributed to the development of the review protocol and will also critically review the manuscript of this review.
reza.hoseinabadi@manchester.ac.uk
Author 4 - Kevin J Munro - The author contributed to the development of the review protocol and will also critically review the manuscript of this review.
kevin.j.munro@manchester.ac.uk