How to Cite:
Khan, S., Zubair, M., Ul Haq, M. I., Jamal, T., Ahmad, A., & Hussain, A. (2022). Frequency of CSF leak after MVD for idiopathic trigeminal neuralgia a observation-based research. *International Journal of Health Sciences*, *6*(S9), 4297–4302. https://doi.org/10.53730/ijhs.v6nS9.13702

Frequency of CSF leak after MVD for idiopathic trigeminal neuralgia a observation-based research

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***Abstract*---**Objective: The purpose of this study was to investigate how often cerebrospinal fluid leaked following microvascular decompression in individuals with idiopathic trigeminal neuralgia. Study Design: Observation-based research. Place and Duration: Neurosurgery Unit, Prime Hospital Peshawar (May 2022 to October 2022). Methods: This research included 58 individuals of all sexes who had idiopathic trigeminal neuralgia. Following written permission, the participant's full characteristics were collected. MVD was performed on all participants. The Neurological Institute Pain score was used to measure results (BNIP). A postoperative check-up was performed. Data were analyzed by SPSS 22.0. Results: In our present research, there were 36 (62.06%) females and 22 (37.93%) males. The individuals' average age was 53.85±8.97 years, and their average body mass index was 28.016±5.42 kg / m^2. The right side was implicated in 36 (58.62%) of the cases, whereas the left side was implicated in 24 (41.37%). The average duration of symptoms was 3.01±1.19 years. Postoperatively, 28 patients (55.17%) had a BNIP

International Journal of Health Sciences ISSN 2550-6978 E-ISSN 2550-696X © 2022.
Manuscript submitted: 9 July 2022, Manuscript revised: 18 Sept 2022, Accepted for publication: 27 Oct 2022

value of 1-2 (healing) and without any medicines necessary, 18 patients (31.03%) had partial recovery with a BNIP value of 3, and 4 (13.79%) participants had a BNIP value of 4 (no recovery). Conclusion: Our data show that problems following microvascular decompression for idiopathic trigeminal neuralgia occur at a decreased prevalence than other current therapies. We observed that 17.24% of patients had cerebrospinal fluid (CSF) leakage after microvascular decompression.

***Keywords*---**Idiopathic Trigeminal Neuralgia, Microvascular Decompression (MVD), Cerebrospinal Fluid Leaks.

Introduction

Cerebrospinal fluid (CSF) leakage is a significant cause of morbidity after microvascular decompression (MVD) therapy. MVD is a surgical method used to cure idiopathic trigeminal neuralgia that targets specific pathological idiopathic trigeminal nerve compression [1]. Despite the advances in surgery skills, problems with this treatment continue to occur. Cerebrospinal fluid leaking is a significant cause of postoperative complications. Infratentorial operations are seven times more likely to produce cerebrospinal fluid than periportal surgeries [2]. The prevalence of posterior fossa surgeries might reach 18% [3]. Cerebrospinal fluid leaking is associated with severe illness and is possibly fatal because of the possibility of infection [3,4,5]. Moreover, the expenses of caring for individuals with this consequence have been projected to be 139% higher than those of individuals who do not have a cerebrospinal fluid leak [3].

Idiopathic trigeminal neuralgia is among the most severe pain disorders, characterized by stabbing or shock-like paroxysmal pain in one or even more trigeminal nerve divisions [6]. The most stimulating cues are minor adjustment and movement [7]. The most prevalent cause of trigeminal neuralgia is SCA [8,9]. Pulsatile compressions of the culprit's vessel cause localized neurodegeneration of the nerve, resulting in neuronal flow short-circuiting and, as a result, trigeminal neuralgia [10]. A complete timeline and a comprehensive medical assessment are used to determine the cause [10]. Magnetic resonance imaging brain distinguishes idiopathic trigeminal neuralgia from long-term complications of trigeminal neuralgia such as cerebellopontine (CP) joint injuries and multiple sclerosis (MS) [8,11]. Initially, carbamazepine medication, in addition to being a diagnosis hallmark of the condition, can alleviate the discomfort. Microvascular decompression, by contrast, has been suggested for long-term pain treatment [9,13,14]. Four, eight, and nine Jannetta fully backed the microvascular compression concept and championed MVD for therapy [15]. In their study, Barker et colleagues discovered a 70percent annual efficacy in the treatment of MVD [6]. The objective of this research was to provide insights into the occurrence of cerebrospinal fluid following MVD for ITN in our locale. Further goals were confirming the etiology and presenting our knowledge of microvascular decompression in these individuals.

Methods

Our observation-based research included 29 cases and was done at Neurosurgery Unit, Prime hospital Peshawar from May 2022 to October 2022. The Prime hospital ethics board approved this investigation. A total of 58 people, both men, and women, with idiopathic trigeminal neuralgia, were included in this research. Following giving written permission to take part in the trial, participants' full identifying details, including age, gender, body mass index, and symptom duration, have been obtained. Others with brain tumors, individuals with traumatic brain injury, and individuals who didn't provide any informed permission were excluded from this research.

All participants had a brain computed tomography scan and a magnetic resonance imaging scan pre-operation to examine their neurological state. MVD was given to each of the participants. By providing a short straight (2.5-4.5 cm) entrance site 0.5 cm far beyond mastoid depression, the asterion is studied until it has been recognized. Just a little (2x3cm) retromastoid craniectomy be performed in this example, showing the crossing of the sigmoid and transversal sinuses. The dura is opened in the shape of a "Y" and fastened to the injury's boundaries. Because of the discharge of cerebrospinal fluid, the cerebellum is permitted to fall back. The tentorium-petrous bone border is pursued until the remaining nerves can detect the idiopathic trigeminal nerve. To identify the problem, a dura assessment is conducted rigorously around the trigeminal nerve from the pons to Meckel's cavern. More than 90% of the time, the culpable vessels are found. To entirely release the nerve from the conflict, each culpable vessel should be separated.

The BNIP value acquired on a postoperative day was used to assess patients' results. Hearing loss, cerebrospinal leak, wound infection, and mortality, among other risks, were explored. Participants' fulfilment was also evaluated postoperatively. Data were analyzed by SPSS 24.0. The average and SD were computed. A list was made to keep track of the amount and frequency of every event.

Results

In our present research, there were 36 (62.06%) females and 24 (37.93%) males. The individuals' average age was 53.85±8.97 years, and their average body mass index was 28.016±5.42 kg / m^2. The right side was implicated in 34 (58.62%) of the cases, whereas the left side was implicated in 24 (41.37%). The average duration of symptoms was 3.01±1.19 years. (Table 1)

Table 1: Demographic data of all participants

Variables	Results	Percentage
Average age (years)	53.85±8.97	
Average BMI (kg / m^2)	28.016±5.42	
Disease Duration (years)	3.01±1.19	
Gender		
Female	36	62.06

Male	24	37.93
Involved Side		
Left	24	41.37
Right	34	58.62

Preoperatively, 36 patients (58.62%) had a BNIP of 4, and 24 patients (41.37%) had a BNIP of 5. Postoperatively, 32 patients (55.17%) had a BNIP value of 1-2 (healing) and without any medicines necessary, 18 patients (31.03%) had partial recovery with a BNIP value of 3, and 4 (13.79%) patients had a BNIP value of 8 (no recovery)10 (17.24%) patients experienced CSF leak, 06 (10.34%) individuals had wound infection, 04 (6.89%) individuals had hearing loss, and 38 (65.51%) individuals had no problems. (See Table No. 2)

Table 2: Postoperative problems in all participants

Variables	Frequency	Percentage
No Complication	38	65.51
CSF Leak	10	17.24
Wound Infection	06	10.34
Hear Loss	04	6.89

Discussion

Idiopathic trigeminal neuralgia is a painful neurological illness that is also among the most frequent. The present research examined the effects of MVD on those who suffered from idiopathic trigeminal neuralgia. In this scenario, around 58 people had MVD. With an average age of 53.858.97 years, the majority of participants (62.06%) were females, whereas the rest 37.93% were men. Such results were in line with several previous research in which female individuals outnumbered male individuals and the most of individuals were above the age of 50 [16-17].

According to the latest research, the average time that symptoms lasted was 3.011.19 years. Before treatment, 18 participants (31.03%) had BNIP values of 06, and 08 participants (13.7%) had BNIP values of 4. Postoperatively, we found that participants (55.17 percent) had BNIP values 1-2 (healing) without medicines, 18 patients (13.79%) seemed to have partial recovery with BNIP values 3 and 10 (limited recovery with prescription needed), and 13.79% of the participants had BNIP values 08 (limited recovery with prescription needed) (no recovery). According to Wang X et al [19], participants (55.17%) said that they had been pain-free post-treatment. BNI 2-3 offered temporary pain relief in 18 participants, and 08 of the individuals (13.79%) were completely pain-free 03 months after commencing therapy.Following the results of some other research on the effects of MVD for ITN done by Adela Wu et al [20], 91.8% of participants observed a reduction in pain after microvascular decompression, whereas 8.2% of participants encountered no pain relief. A vast amount of previous research shows that the microvascular decompression approach reduced pain substantially [21-22]. Rao GB and companions [23] discovered that 65% of participants got immediate postoperative pain reduction, 15% obtained later pain medication, and 20% had no pain medication after microvascular decompression. In the latest research, we identified five participants (17.24%) who had CSF leaks, three patients (10.34%) who had wound infections, two patients (6.89%) who experienced hearing loss, and 32 patients (55.17%) who had no difficulties. Hearing loss, CSF leak, and wound infections were found to be the most prevalent complications associated with MVD, as previously described [24]. This research found that 82 percent of participants were happy with their operation. Sarsam Z et al discovered that after completing the procedure, 84% of individuals were happy with the MVD approach for the method of ITN[25].

Conclusions

Idiopathic Trigeminal Neuralgia represents one of the most severe neurological disorders. Our data show that problems following MVD for ITN occur at a reduced chance than other current therapies. We observed that following microvascular decompression, 17.24% of participants had CSF leakage.

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