

Most Common Etiology of Trigeminal Neuralgia in Patients Treated at EsSalud Cusco from January 2019 to August 2022. Retrospective Study *

Etiología más común de la neuralgia del trigémino en pacientes atendidos en EsSalud Cusco entre enero de 2019 y agosto de 2022. Estudio retrospectivo

Etiologia mais comum da neuralgia do trigêmeo em pacientes tratados no EsSalud Cusco de janeiro de 2019 a agosto de 2022. Estudo retrospectivo

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ABSTRACT

Background: Trigeminal neuralgia (TN) is a painful disease of the trigeminal nerve, triggered by chewing or manipulating the gums. It is urgent for the dentist to be aware of this pathology of non-odontogenic pain, avoiding root canals and extractions for proper interconsultation with neurology and neurosurgery. **Purpose:** To identify the most common etiology of TN in patients treated at EsSalud Cusco from January 2019 to August 2022. **Method:** Observational type, descriptive and retrospective design; the calculated sample of 127 medical records was obtained according to inclusive criteria; the instrument validated by specialists, computerized data from medical records; the variables, measured in data collection sheets by a single evaluator in an Excel sheet. For the most common etiology variable, the scores were according to predisposing factors and etiological factors; while for the NT variable, according to the types of NT and pain scales, both measured by international standards. Finally, the type of analysis was descriptive statistics, the score relationship thanks to Pearson's partial correlation

coefficient, and interpreted according to Cohen's Kappa values. **Results:** Most common etiology variable: Predisposing factor, sex at 79.5 % and as an etiological factor, unknown etiology at 55.1 %. Variable NT: idiopathic type at 34.6 %; according to the EVA scale, of intense pain at 59.1 %. **Conclusion:** According to chi-square 879, the average relationship of the most common etiology of NT has sex as a predisposing factor, being female the most affected at 79.5 %; and unknown etiology as an etiological factor in 55.1 %.

Keywords: dentistry; endodontics; extraction; neurology; neurosurgery; pain; root canal; sex; trigeminal nerve; trigeminal neuralgia

RESUMEN

Antecedentes: La neuralgia del trigémino (NT) es una enfermedad dolorosa del nervio trigémino, se desencadena al masticar o manipular encías. Urge al dentista conocer esta patología de dolor no odontogénico, evitando endodoncias y exodoncias para su correcta interconsulta con neurología y neurocirugía. **Objetivo:** Identificar la etiología más común de NT en pacientes atendidos en EsSalud Cusco desde enero de 2019 hasta agosto de 2022. **Método:** Tipo observacional, diseño descriptivo y retrospectivo; se obtuvo la muestra calculada de 127 historias clínicas según criterios inclusivos; el instrumento validado por especialistas, datos computarizadas de historias clínicas; las variables, medidas en hojas de recolección de datos por un solo evaluador en una hoja Excel. Para la variable etiología más común, las puntuaciones fueron según factores predisponentes y factores etiológicos; mientras que para la variable NT, según los tipos de NT y escalas de dolor, ambas medidas por estándares internacionales. Finalmente, el tipo de análisis fue la estadística descriptiva, la relación del puntaje gracias al coeficiente de correlación parcial de Pearson, e interpretada según valores Kappa de Cohen. **Resultados:** Variable etiología más común: Factor predisponente, sexo al 79,5 % y como factor etiológico, etiología desconocida al 55,1 %. Variable NT: Tipo idiopática al 34,6 %; según escala EVA, de dolor intenso al 59,1 %. **Conclusión:** Según chi cuadrado 879, la relación media de la etiología más común de la NT tiene como factor predisponente el sexo, siendo el femenino el más afectado al 79.5 %; y como factor etiológico la etiología desconocida al 55.1 %.

Palabras clave: dolor; endodoncia; exodoncia; nervio trigémino; neuralgia del trigémino; neurocirugía; neurología; odontología; sexo

RESUMO

Antecedentes: A neuralgia do trigêmeo (NT) é uma doença dolorosa do nervo trigêmeo, desencadeada pela mastigação ou manipulação das gengivas. É urgente o médico dentista estar atento a esta patologia de dor não odontogénica, evitando tratamentos de canal e extrações para uma adequada interconsulta com neurologia e neurocirurgia. **Objetivo:** Identificar a etiologia mais comum de TN em pacientes atendidos no EsSalud Cusco de janeiro de 2019 a agosto de 2022. **Método:** Tipo observacional, descritivo e retrospectivo; a amostra calculada de 127 prontuários foi obtida segundo critérios inclusivos; o instrumento validado por especialistas, dados informatizados de prontuários; as variáveis, medidas em planilhas de coleta de dados por um único avaliador em uma planilha Excel. Para a variável de etiologia mais comum, os escores foram de acordo com fatores predisponentes e fatores etiológicos; enquanto para a variável TN, de acordo com os tipos de TN e escalas de dor, ambas mensuradas por padrões internacionais. Finalmente, o tipo de análise foi a estatística descritiva, a relação de pontuação graças ao coeficiente de correlação parcial de Pearson e interpretada de acordo com os valores de Kappa de Cohen. **Resultados:** Variável de etiologia mais comum: Fator predisponente, sexo em 79,5 % e como fator etiológico, etiologia desconhecida em 55,1 %. TN variável: tipo idiopático em 34,6 %; segundo a escala EVA, de dor intensa em 59,1 %. **Conclusão:** De acordo com o qui-quadrado 879, a relação média da etiologia mais comum da TN tem o sexo como fator predisponente, sendo o sexo feminino o mais acometido com 79,5 %; e etiologia desconhecida como fator etiológico em 55,1 %.

Palavras-chave: dor; endodontia; extração; nervo trigêmeo; neuralgia trigeminal; neurocirurgia; neurologia; odontologia; sexo

INTRODUCTION

The trigeminal nerve, both sensory and motor, is a large cranial nerve; It gives rise to the ophthalmic (V1) branches of sensory fibers, the upper maxilla (V2) of sensory fibers, and the mandibular (V3) of motor and sensory fibers (1). Trigeminal neuralgia (NT) or tic douloureux is a painful disease (2); commonly triggered by chewing and manipulation of the gums. It is likely that patients consult the dentist for the first time before being referred to the neurologist or neurosurgeon (3). According to its topography, the branches that are most affected are V2 and V3, thus independently V1 (4 %), V2 (23 %), V3 (15 %), as well as simultaneously V1 and V2 (16.5 %), V2 and V3 (32 %) (4); It can be divided

into primary, idiopathic or essential, and secondary or symptomatic (5). The NT makes it clear that dentists should consider the visual analogue scale (VAS) when faced with pulpitis without a reasonable organic cause and avoid unnecessary dental procedures (6).

As the most common etiology, 2 factors stand out: a) Predisposing factors: age between 50-90 years (4) and sex, a higher proportion in female patients 76.7 % (1, 2). b) Etiological factors: the SARS-CoV-2 coronavirus, a possible etiology of secondary TN, due to multiple manifestations in the central and peripheral nervous system, with musculoskeletal and neuropsychiatric symptoms, without classic semiology, with intense and constant headache, with insomnia, anxiety, and unexplained depression in patients with no history (7), requiring more studies to elucidate its neuropathology (8); genetic predisposition, multiple genes and/or subsequent products, such as ionic channels (9), affect 4-13 people per 100,000 inhabitants (9); the brain tumor of the posterior fossa generates typical neuralgia, with an association of less than 0.8 % (5); root demyelination of the nerve, which according to Moses, Beaver and Kerr, vascularly compresses the posterior region of the root, causing triggers (9); finally, the unknown etiology, due to vascular compression of the nerve (10) or according to Giriya, without apparent cause (11).

However, the predisposing and etiological factors reflect an intimate link if they interact, because this pathology presents as odontogenic pain (12), middle-aged and elderly patients suffer more often from TN in 66.7 % (13), where the majority are 67 % female, and 33 % male (14). Considering COVID, a diagnostic challenge (7). Furthermore, investigators have found multiple genetic and molecular targets involved with a pathophysiology possibly related to the creation of trigeminal neuralgia (9). Extremely, facial pain can occur contralateral to the tumor lesion, due to sliding of the mass in the brain stem (5). And in demyelinating pictures, they would cause an electrical action with paroxysmal pain due to contact between the fibers (1). Lastly, if the semiology were atypical, having ruled out both factors, one could be facing an unknown etiology of TN (11).

In this regard, Antonaci, *et al.*, (2020) point out that this procedure avoids root canal treatments and unnecessary extractions, benefiting patients, since the quality of life is seriously affected (15,16). For this reason, research is relevant in all aspects of TN (natural history, clinical picture, diagnosis, treatment, and prognosis) (17), because it would stand out as a picture of atypical orofacial pain (3).

The purpose of this study on the most common etiology of TN in patients treated at EsSalud Cusco from January 2019 to August 2022 is to make Dentists aware of the importance of making interconsultation with the neurologist and neurosurgeon, in situations of non-odontogenic pain such as TN. At the Adolfo Guevara Velasco-EsSalud Cusco National Hospital, there has been a lack of data on the prevalence and incidence of TN; there is little communication between the dentist with the disciplines of neurology and neurosurgery, regarding this condition (18, 16).

Specifying the problem, the central question of this paper is: What is the most common etiology of TN in patients treated at EsSalud Cusco? That is why this study highlights as a central objective to identify the most common etiology of TN in patients treated at EsSalud Cusco (18).

MATERIALS AND METHODS

The type of study was observational, with a descriptive and retrospective design (18). With a population of 255 clinical records between the years 2019 and August 2022, with a diagnosis of TN in the areas of Neurology, Neurosurgery and Dentistry of the Adolfo Guevara Velasco Hospital. The calculated sample consisted of 127 medical records (HC), according to inclusion criteria with a diagnosis of TN from the Neurology, Neurosurgery and Dentistry areas of the EsSalud Cusco Hospital. The instrument and unit of analysis to be used was the computerized data of the clinical history; and the method, indirect observation (18).

To be included, the following criteria were taken into consideration (1): Computerized data from medical records of the Neurology, Neurosurgery and Dentistry services that indicate NT as a diagnosis and that have been diagnosed by physicians of these disciplines. Computer data from medical records whose diagnoses date from January 2019 to August 2022. Patients older than 20 years. For their exclusion, the following aspects were considered: Computerized data from clinical histories whose diagnosis of TN is partial. Computerized data from medical records whose diagnosis does not specify age, gender, affected facial area and injured branch. Computer data from medical records whose diagnoses are after August 2022 (19).

Through the informed consent addressed to the director of the Adolfo Guevara Velasco National Hospital, as well as to the head of the Neurology unit, strategies were detailed to manage the confidentiality of identifiable data, storage controls, handling and shared personal data, in this proposal investigative. In turn, the following requirements were followed: The necessary data was collected, without using personally identifiable information, withdrawing immediately after data collection. On the other hand, for no reason were unencrypted personal data leaked, nor were original computerized collection documents retained (18).

Procedures

By sending a request to the director of the Adolfo Guevara Velasco National Hospital, with the participation of the areas of Neurology, Neurosurgery and Dentistry in the collection of information based on physical or computer data. Phases were established (18).

First phase: Procedures to obtain the consent of the study with its respective annexes through the research protocol, presented the research project with the approval of the head of the EsSalud Training and Teaching Office, the authorization resolution for its development was obtained (19).

Second phase: Based on similar NT investigations, found in search engines both in PubMed, SciELO and in academic Google, from national and international indexed journals, both in English and Spanish, a data collection sheet was conducted. data, duly reviewed and evaluated by specialist doctors in the area of NT. For both the most common etiology (X) and NT (Y) variables, metric aspects included in the computerized records of medical histories were considered, later developed in the topic of operationalization of variables (13,20).

Subsequently, the medical data that met the inclusion criteria were selected, then the purpose of data collection in the different specialties was explained to each head of the area involved (21)

Third phase: the pilot test was conducted via video conference with the ZOOM application, together with the neurologist participating in this research, as well as the members of this study, to get rid of any type of bias; Finally, a filter with the head of the Neurology area. Finally, the results of said test and the data collection sheets were evaluated by a neurologist examiner involved in the research (22).

Fourth phase or definitive test: Together with the data with G50.0 diagnoses of TN from the Adolfo Guevara Velasco Hospital, provided on a USB by the Planning Office, the data was collected on a Mac Book Pro 14-inch laptop, using the program Microsoft Excel 2022. Three sessions of 5 days each were sufficient; On the first visit to Neurology, data from 255 computerized clinical histories of patients diagnosed with TN were investigated; in the periods January 2019 to August 2022. In the second visit, data from medical records of patients with surgical treatment for TN were included. In the last visit to Dentistry, the same data was reviewed, especially those with massive root canal treatment, multiple extractions, cases of the same dental piece that have undergone root canal treatments, extractions in remarkably close dates and those dental prosthetic treatments. that were triggers of the NT (19).

To collect the information in an orderly and unbiased manner, the Excel program was used; describing in a table, all the information of the variables X and Y, dimensions, indicators and indices, (see the section on the presentation of variables). It is worth mentioning that the number of medical

records were also included in these tables, for pragmatic purposes; in such a way that all the information was useful, practical and easy to process for the statistical part (19).

Fifth phase, the evaluation of the results, was assigned to a single evaluator; according to the use of duly calibrated criteria. The numerical data of the information collection were entered into a data table, adding columns and interpreting the scores of the casuistry found; the interpretation was made by the determination of ranges, where the cuts were established by the investigator and the Gold Standard in the study. The distribution and analysis of the ability to collect information was conducted thanks to optical control in frequency distribution tables, like the figures. Gonzales *et al.*, (2007), the type of analysis was descriptive statistics, the relationship of the score based on the pathogenesis of TN was made thanks to Pearson's partial correlation coefficient, finally, said correlation was interpreted according to values suggested by Cohen's Kappa. (22).

Formal and structured data collection instruments, of an informative and instructive nature, were validated towards more objective and truthful data, previously established in Microsoft Word format, to then be distributed in Microsoft Excel, ready for collection (23).

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The calibration of both the inspectors and the main examiner who evaluated the different medical and dental records of the NT occurred at the beginning of the study with discussions about judgments of the different possibilities of genesis of the neuralgia of the 5th cranial nerve, serving at the same time as references. neurologists participating in this research. It was used according to the intraclass correlation coefficient, specifying the reliability during the measurement (18, 23).

Variable Operationalization

For the variable X "Most common etiology" the dimensions and indicators were taken as: Predisposing factors: Age (20-40/ 41-60/ 61-80/ 81-99), sex (male/female) and year (2019-2022). And etiological factors: COVID (yes/ no/ NR/ test+/ test-/ vaccinated/ not vaccinated), genetics (yes/ no/ NR/ white ethnicity/ mixed race/ indigenous/ Afro-descendant), tumor (no/ NR), demyelination (yes/ no/ with nuclear magnetic resonance MRI/ without MRI/ NR), and unknown etiology (yes/ no/ NR), whose indices were (always 1/ frequent 2/ sometimes 3/ never 4).

While for the variable Y "NT" the dimensions and indicators were taken Types of TN: Classic (due to vascular compression), secondary (due to underlying neurological disease), idiopathic (of unknown etiology) and NR, of indices (always/frequent / sometimes/ never) (20). And pain scales: (VAS visual analogue scale), whose indices (without pain 0/mild 1-3/moderate 4-6/intense 7-10), (mental disability), of indices (with grimaces/without grimaces/NR / with PD pupil dilation/without PD/NR/referred to Lima/not referred/NR/daily/weekly/NR) and (Alcántara and Gonzáles pain test), their indices (affected branches, V1/V2/V3/V1 -V2/V2-V3/V1-V2-V3/NR; affected side, right/left/both/NR; onset of pain, mild/moderate/sharp/NR; duration, 1 second to 2 minutes/ greater than 2 minutes /NR; type of pain, provoked/ spontaneous/ NR; provoked stimulus, none/ innocuous mechanical/ movements/ NR; pain between paroxysms, yes/no/NR and additional continuous pain, yes/no/NR) (13, 20, twenty-one).

Data Collection and Analysis

The data collection sheet was re-evaluated by specialist doctors in the area of NT, based on the study by Jaramillo and Mendoza. Manufacturing the data collection instruments, as follows: The variable X expressed factors that trigger and originate from the NT; variable Y valued the type and scales of pain; said information, specified in the previous point. Above all, gathering clinical histories through

computerized data, from the areas of neurology, neurosurgery and dentistry, with the help of quantitative observation and registration tables (4). The intention of the study, the time, the number of medical records, the facilities and the ability to write the instruments were considered (23). Finally, both variables increased their reliability in data collection when calibrated with Cronbach's Alpha; Resulting for both variables (most common etiology and NT) .739 (73.9 %); The applied instruments being of a high tendency, according to the response of the sample of 127 HC (19, 23).

RESULTS

In this study of 127 computerized data from medical records: Regarding the most common etiology of TN in patients treated at EsSalud Cusco from January 2019 to August 2022, the following have been identified: As predisposing factors; the female sex represented by a total of 79.5 % and 20.5 % of the male sex (Table 1), with 41.7 % of age range between 41 to 80 years and 3.9 % between the ages of 81 to 99 years. And as etiological factors, unknown etiology stands out at 55.1 %, compared to 18.9 % of known etiology, with a mestizo ethnic component of 73.2 % and 26.8 % of indigenous ethnic component.

Within the most common etiology in EsSalud Cusco for predisposing and etiological factors, there is a higher proportion of females between the ages of 41 and 80, because it is the most prone group according to the literature (5); At the same time, the lack of radiological medical equipment in disuse also constitutes worrying data, which prevents it from being able to specify the diagnosis of the original cause in said mestizo public.

Between NT and age, it was determined that there is a medium relationship, with 41.7 % in fluctuating ages of 41-60 and 61-80 years, and 3.9 % between 81-95 years.

Data consistent with the literature (4), however, those over 81 years of age recorded clinical data of patients who have died to date, perhaps due to natural causes or the COVID-19 virus.

For the relationship between NT and sex, among those surveyed, 79.5 % are female and 20.5 % are male.

Consistent with the data of the Peruvian population according to sex by the Peruvian National Institute of Statistics and Informatics (INEI) of 2020, indicating a ratio of 99 men for every 100 women (22). In addition, that by virtue of young people, more female than male in a 3:1 ratio, under 40 years of age who suffer from NT, it may be a first symptom of multiple sclerosis (11).

The high relationship that exists between NT and COVID is associated in such a way that 3.1 % did give a Positive Test to COVID-19 and not 2.4%; 98.4% of them do not record anti-COVID vaccine data in their medical records, but 1.6 % did; and of the unvaccinated patients, 98.4 % do not record information in their records and 1.6 % did not receive it.

Since in the antecedents cases of NT were detected after the anti-COVID vaccine (7, 24); In this investigation, a 51-year-old patient of Indigenous ethnicity, vaccinated with the 4th dose, stated that she was diagnosed with post-vaccine secondary type TN (19, 24).

The average relationship that exists between NT and genetics was established, 73.2 % of cases corresponding to the mestizo ethnic group and 26.8 % of Indigenous ethnic groups.

There is a greater proportion of the mestizo ethnic group, because Peru is a Latin American country, with ethnic groups, mestizo, Indigenous, Asian, Spanish and African. It should be noted that genetic predisposition may involve multiple genes such as ion channels, making TN multicausal (9).

Due to the high relationship that exists between TN and tumors, 80.3 % do not record data in their clinical records and 7.9 % do.

Those who underwent surgical treatment and diagnosed by nuclear magnetic resonance NMR, receiving pharmacological treatment such as antineuralgic, antineuropathic, antidepressant neuromodulators, anticonvulsants; neurosurgically thanks to NT surgery, suboccipital craniectomy, craniotomy, trigeminal microvascular decompression, gamma knife, and rhizotomy (21, 25, 26).

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The relationship between NT and demyelination, 89.8 % did not record information in the computerized data and only 4.7 % did.

There are cases of demyelination, and they are included within the 18 reports, in which Nuclear Magnetic Resonance (NMR) was used until before 2020, the date on which said equipment stopped working to date (21).

The relationship between NT and unknown etiology (Table 2) is present at 55.1 % and not at 18.9 %.

A domain of causes of TN due to unknown etiology is found, due to what has already been described for the problems derived from the lack of maintenance and acquisition of MRI and in this study, this represents the one with the greatest relationship between etiological factors and unknown etiology. perhaps due to intra-pandemic telephone monitoring of COVID-19 (1, 18).

Regarding TN, in EsSalud Cusco, according to the type of TN (Table 3), the idiopathic type frequently predominates at 34.6 % in contrast to 10.2 % of the secondary type presented sometimes; meanwhile to pain, in (Table 4) the distribution of the VAS pain scale (Table 4) is observed, an intense pain in 59.1 % of cases compared to 5.5% of mild level. For the mentally disabled scale, no grimaces were detected in 96.1 % compared to 3.9% in those who were detected; No data on pupillary dilation was recorded in the computerized data at 96.1% compared to 3.9 % of cases where there were no pupillary dilations; Regarding the mentally disabled, the painful frequency is daily at 29.9 %, as opposed to 7.1 % weekly.

Regarding the referral of cases to Lima, 78 % did not manifest cases, in relation to the 22 % that do not record data in their clinical history; according to the Alcantara and González Test, the most affected branches are V1, V2 and V3 at 18.9 %, compared to 2.4 % corresponding to branch V1; Regarding the affected facial side, the left is the most affected at 35.4 % compared to 7.9 % manifested on both sides; with a sudden onset of pain in 55.9 % compared to 7.1 % of moderate intensity; with a duration that fluctuates between 1 second to 2 minutes in 11 % against 10.2 % of pain permanence greater than 2 minutes; Regarding the type of pain, it is spontaneous at 49.6 % compared to 27.6 % of the provoked type; alluding to the stimulus provoked, 55.9 % correspond to the innocuous mechanical type in contrast to 15.7 % due to movements; pain between paroxysms yes to 37.8 % and no to 7.9 %; finally, the additional continuous pain was present in 55.1 % of cases and not in 7.1 %.

The cases of idiopathic TN are likely due to the lack of nuclear magnetic resonance (MRI) (5, 22), which help in complex diagnostic treatments so that they can be referred to the operating room or to Lima, making the task of the doctor difficult, guided by characteristic paroxysms (6, 18). Pharmacological therapy is without effect in patients who suffer from intense, daily, spontaneous, sudden pain and in the three branches of the trigeminal nerve, which may require the approval of the neurosurgeon (26).

TABLE 1
Frequency of predisposing factors “sex”

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	Female	100	79,5	79,5	79,5
	Male	27	20,5	20,6	100,0
Total		127	100,0		

Source: SPSS Vs26

TABLE 2
Table of frequencies on the etiological factors “unknown etiology”

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	Does no register	33	26,0	26,0	26,0
	Yes	70	55,1	55,1	81,1
	No	24	18,9	18,9	100,0
Total		127	100,0	100,0	

Source: SPSS Vs26

TABLE 3
Table of frequencies on the type of trigeminal neuralgia

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	Classic	40	31,5	31,5	31,5
	Secondary	13	10,2	10,2	41,7
	Idiopathic	44	34,6	34,6	76,4
	Does not register	30	23,6	23,6	100,0
	Total	127	100,0	100,0	

Source: SPSS Vs26

TABLE 4
Frequency table on visual analog scale (vas)

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	Mild pain (1-3)	7	5,5	5,5	5,5
	Moderate pain (4-6)	13	10,2	10,2	15,7
	Severe pain (7-10)	75	59,1	59,1	74,8
	Does not register (0)	32	25,2	25,2	100,0
	Total	127	100,0	100,0	

Source: SPSS Vs26

DISCUSSION

Faced with the dentist's obligation to know this pathology of non-odontogenic pain, to avoid unnecessary root canals and extractions through correct consultation with neurology and neurosurgery

(16), a question arises: What is the most common etiology of TN in patients treated at EsSalud Cusco? Sex is the predisposing factor, with the female gender being the most affected at 79.5 %; and unknown etiology as an etiological factor in 55.1 %.

Based on the findings, the alternative general hypothesis test was accepted, with a significance level of 5 %, and a chi-square of 879, which establishes the existence of a medium relationship in the most common etiology of trigeminal neuralgia. in patients treated at EsSalud Cusco. These results are related to Alcántara and Sánchez (2016), these authors state that the incidence of TN is between 4-13 % (22). and with Boto (2010), who expresses, it is uncommon for it to present as trigeminal status or rapid succession of tic-like spasms caused by any stimulus (5). This is consistent with what was found in this study.

From what was found within the most common etiology, as predisposing factors: Regarding the relationship between TN and age in this study, there is a medium relationship between them, with ages between 41 and 80 years. According to Alcántara and Gonzales (2017), who mention the story of a 49-year-old patient with a 10-year history of sharp, dull, constant pain from mechanical and sensory stimuli in the third branch of the trigeminal nerve (14), For his part, Vásquez (2020), NT was triggered mostly between 60 and 69 years of age, and unilaterally on the right side at 59.5 % (1). And on the one hand, Grin *et al.*, (2018) highlight the case of a 73-year-old patient who underwent root canals in teeth: 2.2, 2.3, 2.5, the latter with apicoectomy, in addition to extractions in 2.4 and 2.6, when the real diagnosis was type I TN (12).

Contrary to Ayele *et al.*, (2020), found in their studies that the age group of the 61 participants ranged from 21 to 78 years, while 68.9% manifested involvement of the right facial side, where the most common branch was the mandibular 47, 5 %; (90.2 %) of the patients met criteria for classic NT and 9.8 % had symptomatic NT. Most participants reported mixed types of pain, such as burning, shooting, and electric shock-like (27).

Regarding the average relationship between NT and sex, in this study there is an average relationship between the two, where females are registered at 79.5 % or 100 women, compared to the male sector of 20.5 % or 27 males: both in the years 2019 at 6.3 %, 2020 at 44.1 %, 2021 at 35.4 % and 2022 at 14.2 %. Likewise, Antonaci *et al.*, (2020) mention that they recruited 102 patients, mostly women in a 2.64:1 F:F ratio (15).

Conversely, Ayele *et al.*, (2020), found in their studies that 50.8 % were male, and that 41 % had a history of dental extractions on the compromised side; identifying a well-defined trigger zone in one third (36 %) of the cases (28). And, on the other hand, Tragodara-Moreno (2020), believes that if not treated properly it can lead to stress at work, social, psychological and to suicide itself (2).

Of what is stated within the most common etiology, such as etiological factors: Regarding the relationship between NT and COVID in this study, a medium relationship is found. However, it only represents 3.1 % of the case material responding to the type of secondary TN. On the other hand, Duran and Duran (2021), mention that 237 patients presented post-COVID neurological manifestations (4.67 %); The "post-COVID neurological syndrome" represents a diagnostic challenge for the clinical neurologist due to its multiple manifestations: to the central and peripheral nervous system (7).

By contrast, Kaya and Kaya (2021); found in their studies that a patient developed acute trigeminal neuritis after the Pfizer-BioNTech vaccine against SARS-CoV-2 and at the same time, the patient was consulted for toothache (24).

And, on the other hand, Molina *et al.*, (2021), are of the opinion that, although the PCR test was negative, for the 65-year-old patient, the rapid test showed positive IgM and IgG serologies for SARS-CoV-2, and an initial analysis showed a slight elevation of the D-dimer of 800 ng/ml (upper limit: 500 ng/ml). Due to these results, the patient was diagnosed with TN secondary to a SARS-CoV-2 viral infection. However, the pain resolved with improvement in specific COVID-19 symptoms. Therefore, the new coronavirus SARS-CoV-2 is a possible etiology of secondary TN. However, more studies are needed to elucidate the neuropathology of this viral infection (8).

With reference to the relationship between NT and genetics in this study, there is an average relationship, whose ethnic component is mestizo at 73.2 % compared to 26.8 % of Indigenous ethnicity. Of them, the majority are female, therefore, the ethnic component rather than the genetics itself is a factor to consider. Probably due to the ethnic mix, especially Spanish and African. On the other hand, according to Boto (2010), they mention that it is rarely genetic (5); while Smith *et al.*, (2021), emphasize that the genetic predisposition to TN may involve multiple genes and/or subsequent products, such as ion channels, therefore, TN could be multicausal (9).

Conversely, Mannerak, *et al.* (2021), found in their studies that about 1-2 % of cases in NT have a hereditary form. Available human studies propose the following genes as contributors to the development of NT: CACNA1A, CACNA1H, CACNA1F, KCNK1, TRAK1, SCN9A, SCN8A, SCN3A, SCN10A, SCN5A, NTRK1, GABRG1, MPZ gene, MAOA gene, and SLC6A4. Therefore, its role in the family NT has yet to be addressed. In sum, this systematic review suggests a greater role for genetic factors in the pathogenesis of TN than previously assumed (29).

Regarding the relationship between NT and tumors, there is also a relationship, of only 7.9 % of cases for which the origin of NT was a compatible tumor in 10 people, 15 people corresponding to 11.8 % who did not report a case tumor, and 80.3 % of data that includes 102 patients, do not record any data in their medical records. Of this case material, some of these patients had to be submitted to the operating room by the neurosurgery service, since only 6.3 % were evaluated by MRI. Instead, Antonaci *et al.* (2020), mention that it is urgent to increase neurological knowledge to timely recognize the clinical picture of TN and adequately adhere to specific guidelines. This can lead to a favorable outcome for patients, whose quality of life is often severely affected (1).

By the way, Mo *et al.*, (2021), opine that TN patients exhibited reductions in cortical indices in the anterior cingulate cortex (ACC), middle cingulate cortex (MCC), and posterior cingulate cortex (PCC) relative to controls. In addition, they had a generalized reduction in subcortical volume that was most evident in the putamen, thalamus, accumbens, pallidum, and hippocampus (25).

For demyelination, 89.8 % do not record any data in their clinical record, while 4.7 % do so and 5.5 % do not. The failure and disuse of the nuclear magnetic resonance (NMR) equipment since 2020 meant that only 14 patients of the 127 analyzed benefited, harming the rest; alternatively, 15 multiple spiral tomography (TEM) scans, 9 computed axial tomography (TAZ) scans, 4 magnetic resonance imaging (MRI), 4 brain tomography (CT) scans, and one brain radiograph (CR) were verified. However, Lara C. (2021), highlight that, according to research on nerve root demyelination, according to Moses, Beaver and Kerr it is manifested by vascular compression of the posterior root region, with the presence of degenerative irregular myelin along the nerve path. trigeminal, and due to this segmental demyelination, non-synaptic transmissions are revealed, giving rise to the triggers (10).

On the other hand, the greatest tendency was the unknown etiology at 55.1 % within the 127 cases, 26 % do not declare any record in the EsSalud-Cusco medical computerized data and 18.9 % do not fit within this problem: confirming the problem of medical equipment. However, Jay and Barkin (2022) highlight that isolated "facial migraine" is rare (0.2 %), triggering diagnostic errors with dental pathology and maxillary sinus (30).

Regarding the NT, for the type of NT, the idiopathic predominates at 34.6 %; meanwhile for pain, according to the EVA scale, it is intense at 59.1% of cases, in mentally disabled patients the painful frequency is daily at 29.9 %, for the Alcántara and González Test the most affected branches are V1, V2 and V3 at 18.9 %, whose left facial side is the most affected at 35.4 %, with a sudden onset of pain at 55.9 %, lasting between seconds to 2 minutes in 11 %, of a spontaneous type at 49.6 %, with a provoked stimulus innocuous mechanical in 55.9 %, with pain between paroxysms in 37.8 % and additional continuous pain in 55.1 %.

On the other hand, Alcántara and Sánchez (2016), mention options for pharmacological treatment: (Carbamazepine 100 mg- 2 times a day, Oxcarbazepine 300 mg- 2 times daily, Baclofen 5 mg- 3 times

a day, gabapentin 100 mg- 3 times daily , pregabalin 75 mg one nightly dose, lamotrigine 25 mg- once daily, phenytoin 50 mg- 3 times daily, topiramate 25 mg- one nightly dose for 7 days and then increase for 1 to 2 weeks in doses of 25-50 mg 2 times a day, levetiracetam 250 mg- 2 times daily); notwithstanding the non-medical resolution, it causes surgical recourse, be it open or conservative percutaneous, very effective; likewise, radiofrequency thermocoagulation, optimal against pain at 97%, with recurrence at half a year of 25 % and with presence of pain at decade of 52.3 %; as complications, facial hypoesthesia 1-9 % and corneal anesthesia 0-17 % (21).

In the opposite way, Alcántara and Gonzales (2017), found in their studies the history of a 49-year-old patient with a 10-year history of acute, dull, constant pain from mechanical and sensory stimuli in the third branch of the trigeminal nerve (20). On the other hand, Boto (2010), believes that the V2 and V3 branches are more affected in 42 % of cases, the V2 branch alone in 20 %, the V3 branch alone in 17 % and the V1 and V2 together in 14 %, and V1, V2 and V3 at 5 % and V1 alone at 2 % (5).

CONCLUSIONS

It was identified that there is a medium relationship in the most common etiology of TN, the most common etiology being the female sex at 79.5 % as a predisposing factor and as an etiological factor, the unknown etiology, manifested as the highest proportion at 55.1 %.

RECOMMENDATIONS

It is suggested to the dental union, greater interconsultation with Neurology in case of diagnostic doubts in cases of atypical toothache, especially in female patients; Likewise, the specialties of Neurology and Neurosurgery are entrusted with training and clarifying the diagnosis of TN in the dental profession, even more so in age ranges greater than 40 years.

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