

Original articles

Synchronous teleconsultation in the management of temporomandibular disorder

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ABSTRACT

Purpose: to analyze synchronous teleconsultation as a support tool in the management of temporomandibular disorders in primary health care and to identify which factors have an impact on decisions about teleconsultation.

Methods: retrospective study performed in TelessaúdeRS, between May 2018 to May 2020. This study used primary data from synchronous teleconsultation, requested by primary health care professionals and carried out by multiprofessional teleconsultants. The data collected were the information reported by the requester, the teleconsultant's suggestions and if there was referral of the patient for specialized care after teleconsultation. The statistical association was investigated between patient characteristics and decision of teleconsultation; and teleconsultation conduct suggestions and decision of teleconsultation, using Fisher's exact test and modeling was performed using binary logistic regression considering 5% of significance ($p \leq 0.05$).

Results: during the period, 56 teleconsultations had a temporomandibular diagnostic hypothesis, these 79.2% patients were female and the average age was 43.7 years. In 59.1% of teleconsultations, primary care management was suggested, with 72.4% of patients being managed. An association was found between the decision of teleconsultation and referral to specialized care ($p < 0.001$). The trauma report ($p = 0.004$) was associated with a greater chance of being referred for special care and suggestions for pharmacological ($p < 0.001$) and non-pharmacological ($p = 0.007$) treatments were introduced among the teleconsultation managed in primary care.

Conclusion: teleconsultation helped to manage the majority of temporomandibular disorder, streamlining care and having the potential to avoid unnecessary referrals to special care.

Keywords: Telemedicine; Temporomandibular Joint Disorders; Temporomandibular Joint Dysfunction Syndrome; Primary Health Care

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INTRODUCTION

Temporomandibular disorder (TMD) is a group of disorders involving the masticatory muscles, temporomandibular joint, and structures associated with the stomatognathic system¹. It affects 5–12% of the adult population worldwide²; the prevalence of at least one sign or symptom in the Brazilian adult population is 36.2%³. Strategies that seek to address this public health issue and optimize available resources are fundamental to attaining an accessible and quality health system. In this sense, telehealth, as a support tool in primary health care (PHC), can support professionals in the evaluation of TMD cases, assisting in both the diagnosis and treatment, with the potential to avoid travel and reduce costs for the system⁴.

Telehealth is used as an instrument for health-related remote activities, enabling interaction between professionals, the exchange of information and knowledge, and remote access to diagnostic and therapeutic support resources⁵. In order to increase access to health through PHC — mainly in regions distant from reference centers — the Brazilian Ministry of Health instituted the National Telehealth Program Brazil Networks in 2007, with telehealth centers available to primary care professionals. Among these, TelessaúdeRS-UFRGS is the only interprofessional synchronous teleconsultation service in Brazil, which provides, in addition to telediagnosis, tele-education, and tele-regulation activities⁶. In 2018, the service was expanded with the inclusion of multi-professional care⁷.

Teleconsultation constitutes a support option in healthcare⁸, enables the discussion and solution of cases through technical-assistance support and allows continued professional education using remote resources^{9,10}. These benefits can increase the quality of the service provided in PHC, which is essential for the TMD-affected population seeking these points of care¹¹. The ability of professionals to screen for signs and symptoms, functional disability, and associated mental disorders is fundamental in diagnosing and choosing an effective and viable treatment¹². Studies indicate several gaps in knowledge and a tendency to choose invasive and irreversible treatments, such as occlusal adjustment, orthodontics, and oral maxillofacial surgery, being referred to specialized care (SC)¹³⁻¹⁶. This trend contrasts with current evidence, where conservative and minimally invasive therapy is recommended as the first choice for the majority of TMD cases: the earlier the approach, the better the result outcome¹⁷⁻¹⁹. The management of TMD in PHC consists of conservative

and low-cost therapies, with identification of signs and symptoms, removal of harmful habits, behavioral therapy and pharmacological treatments.

The relationship between telehealth and health systems has grown globally. However, studies relating teleconsultation and TMDs are still scarce²⁰⁻²², and only one study approached the subject in a PHC context⁴. The objective of this study was to analyze synchronous teleconsultation as a support tool in the management of TMD in PHC and to identify which factors have an impact on decisions about teleconsultation.

METHODS

This study was approved by the Research Ethics Committee of the Clinical Hospital of Porto Alegre (CHPA), Brazil, protocol number 3.796.755. Everyone involved in the study signed the CHPA data usage agreement. Patients, applicants, and teleconsultants were not identified. This retrospective study used primary data from synchronous teleconsultation requested by PHC professionals and carried out by multiprofessional teleconsultants (family and community physicians, dentists, nurses, psychologist and speech-language-hearing therapist). The study was conducted at TelessaúdeRS-UFRGS, a research center linked to the Graduate Program in Epidemiology of the Federal University of Rio Grande do Sul (UFRGS), located in the city of Porto Alegre, Rio Grande do Sul, Brazil, and available to approximately fifty thousand potential professionals in the Family Health Strategy (FHS)²³. The research hypothesis was that teleconsultation could constitute a support tool to clear doubts about TMD management and conduct, optimizing care in PHC.

The inclusion criteria were: teleconsultations conducted between May 2018 to May 2020, where “temporomandibular joint disorders” (CID-10 K07.6) constituted a diagnostic hypothesis. The exclusion criteria were: teleconsultations canceled by the teleconsultant due to failure to contact the applicant, or which were outside the scope (urgent and emergency services).

Teleconsultants filled out the case data and doubts in the online platform, according to the applicant's report, and asked about the patient characteristics: oral pain, temporomandibular dysfunction, auricular dysfunction, headache, parafunctional habits, associated disease, temporomandibular joint trauma, non-pharmacological and pharmacological treatments. Following which, they suggested the conduct and the

decision of the teleconsultation, that is, management in the primary health care or referral to specialized care. Teleconsultation is answered based on available scientific evidence in the current literature^{24,25} and adapted to the regional reality, the teleconsultations were carried out in real-time through a free telephone service⁷.

For the study, the reported data on the sex, age, Brazilian state, national health card (NHC), TMD signs and symptoms of the patient, parafunctional habits, temporomandibular joint trauma, and associated disease have been collected. As for prior treatments, the information provided about pharmacological and non-pharmacological treatments was included. Data on the conduct suggested by the teleconsultant were obtained: pharmacological (anti-inflammatory, muscle relaxant, and antidepressants), non-pharmacological (removal of parafunctional and harmful habits, self-care, behavioral therapy, occlusal splints and dental rehabilitation) treatments, and the teleconsultation decision. In order to check whether the patient was referred by the requester after the teleconsultation, Consultation Management (GERCON) - a system for regulating specialized consultations within the Unified Health System (SUS), linked to the State Health Secretariat of Rio Grande do Sul - was consulted.

The data were analyzed using SPSS version 10.0. A descriptive analysis of the TMD patient and the teleconsultant's conduct suggestions were performed. The

relationship between variables was investigated using Fisher's exact test, and modeling was performed using binary logistic regression. Management was assessed through the decision of the teleconsultation and referral to specialized care after the teleconsultation, including those containing the patient's NHC and referring to the state of Rio Grande do Sul. A 5% significance level was considered.

RESULTS

Between May 2018 to May 2020, 385 teleconsultations were carried out, of which 56 received a diagnostic hypothesis of "temporomandibular joint disorders". Of these, 79.2% patients were women, and the average age was 43.7 years. The signs and symptoms reported included orofacial pain (89.3%), TMJ discomfort/dysfunction (80.4%), auricular discomfort/dysfunction (25.0%), and headache (19.6%). Regarding reported risk factors, 19.6% reported parafunctional habits, 14.3% reported associated disease, and 19.6% TMJ trauma. Regarding previous treatments, 21.4% had undergone non-pharmacological treatments, 33.9% had used anti-inflammatory drugs, 8.9% muscle relaxants, and 12.5% antidepressants. Among the variables reported by the patient, trauma ($p=0.004$) was associated with a greater chance of referral suggestion for specialized care (Table 1).

Table 1. Characteristics of patients with temporomandibular disorder reported by the applicant and the decision by the teleconsultation between May 2018 to May 2020

Patient characteristics	N (%)	Teleconsultation decision		OR	CI (95%)	p-value ^A
		Management PHC	Referral SC			
Oral Pain	50 (89.3%)	31 (62.0%)	19 (38.0%)	0.82	0.11 – 4.61	0.8
Temporomandibular dysfunction	45 (80.4%)	26 (57.8%)	19 (42.2%)	0.56	0.11 – 2.24	0.4
Auricular dysfunction	14 (25.0%)	6 (42.9%)	8 (57.1%)	0.34	0.09 – 1.15	0.08
Headache	11 (19.6%)	6 (54.5%)	5 (45.5%)	0.42	0.10 – 1.60	0.2
Parafunctional habits	11 (19.6%)	7 (63.6%)	4 (36.4%)	1.06	0.28 – 4.56	>0.9
Associated disease	8 (14.3%)	2 (25.0%)	6 (75.0%)	0.30	0.06 – 1.38	0.12
Temporomandibular joint trauma	11 (19.6%)	4 (36.4%)	7 (63.6%)	0.26	0.06 – 0.99	0.04
Non-pharmacological treatment	12 (21.4%)	7 (58.3%)	5 (41.7%)	0.80	0.22 – 3.09	0.7
Anti-inflammatory	19 (33.9%)	14 (73.7%)	5 (26.3%)	2.13	0.66 – 7.73	0.2
Muscle relaxant	5 (8.9%)	4 (80.0%)	1 (20.0%)	2.58	0.35 – 52.4	0.4
Antidepressants	7 (12.%)	4 (57.1%)	3 (42.9%)	0.77	0.15 – 4.30	0.8
Overall	56 (100.0%)	35 (62.5%)	21 (37.5%)			

Caption: N = Absolute frequency, % = Relative frequency, PHC = Primary Health Care, SC = Specialized Care, OR = Odds Ratio adjusted, CI = Confidence Interval, ^AWald Test ($p<0.05$)

As for the conduct suggested by the teleconsultant, the use of anti-inflammatory drugs, muscle relaxants, antidepressants, or non-pharmacological treatments was suggested in 53.6%, 57.1%, 30.4%, and 60.7% of the cases, respectively. The suggestions

for non-pharmacological ($p=0.007$) and pharmacological management ($p < 0.001$) were significant for the teleconsultation suggested management in primary care, in relation to referral for specialized care (Table 2).

Table 2. Teleconsultation conduct suggestions and teleconsultation decision between May 2018 to May 2020

Teleconsultation conduct suggestions	N (%)	Teleconsultation decision		OR	CI (95%)	p-value ^A
		Management PHC	Referral SC			
Suggested anti-inflammatory	30 (53.6%)	25 (83.3%)	5 (16.7%)	8.00	2.44 – 30.3	<0.001
Suggested muscle relaxant	32 (57.1%)	27 (84.4%)	5 (15.6%)	10.8	3.21 – 42.5	<0.001
Suggested antidepressants	17 (30.4%)	16 (94.1%)	1 (5.9%)	16.8	2.98 – 3.19	<0.001
Suggested non-pharmacological treatment	34 (60.7%)	26 (76.5%)	8 (23.5%)	4.69	1.51 – 15.7	0.007
Overall	56 (100.0%)	35 (62.5%)	21 (37.5%)			

Caption: N = Absolute frequency, % = Relative frequency, PHC = Primary Health Care, SC = Specialized Care, OR = Odds Ratio adjusted, CI = Confidence Interval, ^AWald Test ($p < 0.05$)

A total of 49 teleconsultations contained the NHC and referred to the state of Rio Grande do Sul. From this group, the teleconsultant suggested PHC management in 59.1% (29) of cases, of which 72.4% (21) were managed and 28.6% (8) were referred. A statistically significant association was found between teleconsultation decision and referral to specialized care ($p < 0.001$).

DISCUSSION

In this study, it was observed that the teleconsultation could be a helpful service to manage TMD cases in PHC. A statistically significant association was found between the teleconsultation decision and referral to specialized care ($p < 0.001$). Trauma reports were associated with a greater chance of referral to specialized care, and there was a statistically significant association between suggestions for pharmacological and non-pharmacological treatments among the teleconsultation suggested to be managed in the PHC system.

Given the scarcity of similar studies, the comparison of the presented data is limited. Only one similar study on TMD was found, which compared a telemedicine service directed towards PHC and the traditional care system in a reference hospital. The results were similar

in both methods; nevertheless, the telemedicine service reduced the waiting time for treatment by 76.3 days and halved the number of work hours lost⁴. These results reinforce the premise that telehealth incorporation has benefits, particularly for remote locations that are distant from reference centers, constituting an efficient option for professionals based in these locations²⁶.

Our findings were similar to data from a systematic review on the topic, which reported that teleconsultation improves patient management and yields positive changes in the diagnosis, treatment plan, referral rate, educational effects, and decision-making speed²⁷. Other studies carried out at the TelessaúdeRS Núcleo, with a focus on oral health, showed a 45% reduction in referrals⁹ and an expansion of access to specialized services²⁸.

A statistically significant association was found between the teleconsultation decision and referral to specialized care ($p < 0.001$). This was expected since supporting decision-making is an objective of the service; nevertheless, this association demonstrates a strong adherence of the applicants to the teleconsultants' suggestions. Celes *et al.*²⁹ ratify that telehealth is a growing public policy as a tool for technical and assistance support, and Bohm *et al.*³⁰ demonstrated that the use of the tool yielded an increase in the quality

of the public health service aimed at oral health. From an economic perspective, Estai *et al.*³¹ proved the effectiveness of telehealth and the potential to reduce costs when compared to the conventional system.

Trauma reports impacted the suggestion for SC referrals, being an important risk factor for TMD³⁰, and requiring, in most cases, complementary imaging and SC referrals³². Suggestions for pharmacological and non-pharmacological management had an impact on the suggestion of managing in the PHC system, which arise from interprofessional discussions. It is observed that the applicants' reports on conservative treatments presented low frequencies, which shows the importance of teleconsultation in suggesting minimally invasive treatments, as these can be performed by PHC professionals¹⁶ and should be the first choice of treatment for most TMD cases¹⁹.

The opportunity for continuous professional education is an important utility of telehealth in the constant improvement of professionals. A study carried out at the Telehealth Center of Minas Gerais, Brazil, reported a high prevalence of teleconsultations with doubts about basic dentistry conduct³³, affirming the primordially of continuing education and periodic training. Regarding TMD, the literature points to a lack of updated knowledge by professionals, highlighting the need for constant updating and knowledge expansion on the subject^{12,13-15}.

As for the limitations of the study, they are linked to the fact that the synchronous platform is semi-structured, and data may be lost in the descriptive fields filled in by the teleconsultant, as well an instrument was not used for the diagnostic of TMD, the diagnostic hypothesis was based through the applicant's report. There is also a gap in this study related to the non-monitoring of patients after teleconsultation to verify whether clinical improvement for cases managed in PHC had occurred. As for the relatively small number of teleconsultations, it is necessary to consider the originality of the study in the international literature, as well as the innovation of the service, which has not been fully disseminated among primary care, with emerging challenges in infrastructure and organization³⁴.

On the other hand, the innovative character of the study, given the scarcity of similar works, showed positive results that teleconsultation is a useful tool in TMD management in PHC. Its main advantage lies in patient management in PHC, reducing both the waiting time for diagnosis and initial treatment and referrals. It also has the potential to reduce costs for both the

system and the patient, particularly those arising from traveling and the use of non-scientific evidence-based treatments. The advantages are presented in a systematic review that demonstrates a positive relationship between telehealth services and patient satisfaction³⁵.

It is suggested to incorporate telehealth as a routine tool for PHC professionals, speeding up care, and increasing the quality of service. However, additional studies are necessary to compare telehealth and conventional systems. Other studies that evaluate cost reductions in the health system and the reduction of lost work hours will contribute to the analysis of this technology in economic and social terms.

CONCLUSION

Telehealth is a viable support tool in primary care, being useful in the management of most TMD cases. It presents the imminence of speeding up the service, avoiding unnecessary referrals, and reducing costs for the system. The results encourage the routine adoption of the service in primary care; moreover, the benefits presented have the potential to be extrapolated to other health care areas.

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