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Telemedicina aplicada à neurologia, um enfoque sindrômico

Telemedicine applied to neurology, a syndromic approach

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RESUMO

Introdução: A telemedicina tem se mostrado inestimável, especialmente em casos como o acidente vascular cerebral, onde acelera o diagnóstico preciso e a iniciação do tratamento trombolítico, reduzindo assim as taxas de mortalidade.

Objetivo: Avaliar a eficácia da telemedicina no diagnóstico de síndromes neurológicas entre pacientes em tratamento ambulatorial por teleneurologia.

Método: Foi realizada uma revisão sistemática da literatura usando uma abordagem qualitativa e descritiva, guiada pela estratégia de busca e análise "PICO". A população do estudo incluía pacientes em busca de cuidados neurológicos ambulatoriais, sendo o principal interesse a avaliação da eficiência da telemedicina no diagnóstico de síndromes neurológicas. Os dados foram coletados nas bases de dados PubMed, Scopus e BVS usando critérios de inclusão e exclusão predefinidos.

Resultados: Vários estudos demonstraram a aplicação bem-sucedida da telemedicina no cuidado neurológico. Por exemplo, as teleconsultas com pacientes diagnosticados com comprometimento cognitivo resultaram em desfechos positivos, reduzindo as demandas enquanto retardam a progressão dos sintomas. No entanto, a viabilidade da telemedicina variou em diferentes regiões e características demográficas dos pacientes, destacando fatores socioeconômicos como determinantes de acessibilidade e aceitação. Além disso, a telemedicina mostrou promessa no manejo de condições neurológicas complexas, como ataxia cerebelar, doença de Parkinson e miastenia gravis, embora com certas limitações na capacidade de exame físico.

Conclusão: Em conclusão, a telemedicina emergiu como uma ferramenta crucial na neurologia, superando barreiras geográficas e aprimorando o acesso ao atendimento especializado. Apesar de sua ampla adoção, os desafios persistem, especialmente na garantia de acesso equitativo a diversas populações. Olhando para o futuro, enfrentar esses desafios e avançar na infraestrutura da telemedicina será fundamental para otimizar a prestação de cuidados neurológicos e melhorar os resultados dos pacientes.

PALAVRAS-CHAVE: Diagnóstico diferencial; Síndrome; Telemedicina; Teleneurologia

Mensagem Central

A telemedicina, utilizando tecnologias digitais, de informação e comunicação, permite a prática da medicina a distância, abrangendo assistência, educação, pesquisa, prevenção, gestão e promoção da saúde. No campo da neurologia, a teleconsulta é uma modalidade fundamental, permitindo consultas médicas remotas entre neurologistas e pacientes, facilitando diagnósticos e tratamentos sindrômicos.

Perspectiva

Estudos mostram que a telemedicina, especialmente aplicada à neurologia, é uma ferramenta essencial para melhorar a eficiência dos encaminhamentos de casos neurológicos. Ela reduz custos em saúde, diminui o tempo de espera para consultas especializadas e garante acesso equitativo ao atendimento neurológico, permitindo um foco detalhado em diferentes síndromes neurológicas.

ABSTRACT

Introduction: Telemedicine has proven invaluable, especially in cases like stroke, where it expedites accurate diagnosis and thrombolytic treatment initiation, thereby reducing mortality rates.

Objective: Evaluate the efficacy of telemedicine in diagnosing neurological syndromes among patients receiving outpatient care through teleneurology.

Method:A systematic literature review was conducted using a qualitative and descriptive approach, guided by the "PICO" search and analysis strategy. The study population comprised patients seeking outpatient neurological care, with the primary interest being the assessment of telemedicine's efficiency in diagnosing neurological syndromes. Data were collected from PubMed, Scopus, and BVS databases using predefined inclusion and exclusion criteria.

Results: Several studies demonstrated the successful application of telemedicine in neurological care. For instance, teleconsultations with patients diagnosed with cognitive impairment yielded positive outcomes, reducing demands while delaying symptom progression. However, the feasibility of telemedicine varied across different regions and patient demographics, highlighting socio-economic factors as determinants of accessibility and acceptance. Additionally, telemedicine showed promise in managing complex neurological conditions such as cerebellar ataxia, Parkinson's disease, and myasthenia gravis, albeit with certain limitations in physical examination capabilities.

Conclusion: In conclusion, telemedicine has emerged as a crucial tool in neurology, overcoming geographical barriers and enhancing access to specialized care. Despite its widespread adoption, challenges persist, particularly in ensuring equitable access across diverse populations. Moving forward, addressing these challenges and advancing telemedicine infrastructure will be paramount in optimizing neurological care delivery and improving patient outcomes.

KEYWORDS: Differential Diagnosis; Syndrome; Telemedicine; Teleneurology

INTRODUCTION

Telemedicine has been used by different medical specialties, with the aim of facilitating contact between patients and physicians, helping to search for diagnoses and maintain monitoring during treatment. It also represents an advance for populations in remote areas lacking specialist physicians, enabling patients facing difficulties accessing healthcare services due to geographic, social, physical or emotional reasons to access specialists from other locations.[1-3]

Another advantage is that teleconsultations generate savings when compared to in-person visits, studies show that around 92% of patients report savings in time and money, which leads to more than 90% of patients choosing to continue treatment remotely.[3] This is currently made possible by internet and mobile phone services that are already available in more than 70% of most countries, facilitating communication between physician and patient, even when separated by long distances.[4,5]

In the field of neurology, telemedicine has been used in cases of stroke, to accurately diagnose and expedite thrombolytic treatment initiation upon arrival at emergency services, reducing mortality.[5,6] However, telemedicine can further assist physicians, facilitating diagnosis of other neurological syndromes and improving clinical decision-making in collaboration with neurologists. The patient also has benefits, as they can contact neurologists directly, without needing referrals or hospital care at first, avoiding unnecessary face-to-face consultations and saving time and money.[7] Besides stroke, other clinical events can be identified through a teleconsultation, such as headaches, seizures, signs of high intracranial pressure, dementia, movement disorders, changes in the course of multiple sclerosis or myasthenia gravis, which can be fatal. It can also assist in assessing adverse drug events or treatment responses, such as symptomatic crises in children with neurocysticercosis following cysticidal therapy.[5,8,9]

There are cases where telemedicine may not be sufficient, such as in patients with Huntington's disease, in which 25% did not maintain virtual consultations.[10] The importance of this article is justified by the need for more studies that evaluate the acceptability and functionality of the digital resource, recognizing advantages or disadvantages in neurological diagnosis.[2,3]

Therefore, this article seeks to evaluate the efficiency of telemedicine for diagnosing neurological syndromes in patients receiving outpatient care through teleneurology.

METHODS

The present study constitutes a systematic literature review of a qualitative and descriptive nature, based on the "PICO" search and analysis strategy, with the guiding question: "How is telemedicine being applied syndromically in neurology, and in what ways is this approach impacting the diagnosis, treatment, and monitoring of patients with neurological conditions?" (Table). The methodological elucidation variables to compose the theoretical framework were Health Science Descriptors (DeCS/MeSH) "telemedicine, neurological syndromes, diagnosis, neurology, treatment" intersected with the boolean operators "AND" and "OR," for searching the PubMed, Scopus, and BVS databases in English and Portuguese languages. Inclusion criteria were defined as prognostic studies regarding the diagnosis of neurological syndromes using telemedicine, observational studies discussing telemedicine as support for referral to neurologists. Exclusion criteria were defined as screening of title, abstract, and full-text reading by at least 2 authors, removing duplicates and other articles not addressing the topic in question. Review articles were also excluded. Following the inclusion criteria, 59 articles were found in BVS, 18 in PubMed and 39 in Scopus. Of these articles, 3 from Scopus, 10 from BVS and 7 of PubMed were selected for the present review following the exclusion criteria.

TABLE — Application of the PICO Strategy

Element	Description
Population	Patients attending outpatient clinics seeking diagnosis.
Intervention	Evaluation of the efficiency of telemedicine for diagnosing neurological syndromes.
Context	Outpatient care provided through teleneurology.
Outcome	Improvement in access to neurological care, increased efficiency in care provision, optimization of response time for diagnosis and treatment, reduction of disparities in access to neurological care, and possibly improvement in clinical outcomes and quality of life for patients.

DISCUSSION

The term "Telemedicine" according to the World Health Organization, has its meaning shaped in the act of providing health services when distance is a barrier, by professionals who use technological communication to exchange valid information for diagnosis, treatment, and prevention of diseases, as well as for research and continuing education in healthcare. Neurology has its historical beginnings in telemedicine as a tool to aid in the rapid diagnosis and treatment of acute stroke in emergency departments with limited accessibility to specialists.[10] Moreover, COVID-19 pandemic further popularized telemedicine due to the flexibility granted by Brazilian authorities to reduce exposure to contamination.

Telemedicine, in general, emerged in 1967, with a system that integrated Boston Airport with Massachusetts General Hospital.[11] In Brazil, telemedicine has been regulated by the Federal Council of Medicine (CFM) since 2002, by resolution 1643.[12] However, teleconsultation was not regulated until the COVID-19 pandemic, when isolation required by authorities and the need to maintain medical consultations and care emerged not only for patients infected with SARS-CoV-2, but also for those with other diseases, becoming an emerging public health issue, regulated by the Ministry of Health by Law 13.989.[13]

For neurology and neurosurgery, telemedicine emerged to improve the initial contact of stroke patients with a specialist, in order to optimize the short treatment window present in this disease more than 10 years ago. Currently, the Brazilian Academy of Neurology is developing a committee to discuss and analyze the application of telemedicine in various areas of neurology in Brazil, thus the telemedicine committee (CAT-ABN) was opened.[10] Similarly to other areas of medicine,

during the pandemic, neurology expanded its horizons to telemedicine. A survey conducted with 3441 neurologists registered with the ABN through online questionnaires showed that only 18.5% were practicing through telemedicine before, while during the pandemic, this number increased to 63.6%.[14]

In addition to the stroke already mentioned, other neurological diseases benefit from telemedicine, likewise patients with cerebellar ataxia, a neurological disease with a broad and heterogeneous aspect that involves both chronic and immune-mediated diseases, which affect cerebellar functioning and compromise physiological functions, causing loss of airway maintenance (bronchoaspiration), cognitive decline and motor system dysfunction. As it is a complex disease and that in itself already has high complication rates, the management and monitoring of these patients has become a challenge for health multi-professionals due to the isolation of COVID-19, as their frequent consultations with therapists, speech therapists, physiotherapists and doctors had to be interrupted, having to opt for alternative options, such as teleconsultation. Thus, this method was used mainly to monitor possible neurological decline, while creating a new environment for social interaction. To this end, seven steps were suggested, one of which was "assess the general mental state and speech and for examination of hyperkinetic movement disorders, ataxia, manual dexterity and balance".[15]

Thus, there was an exponential increase in the number of neurologists who, with the advent of the pandemic, had to adapt and start providing online care.[14] In this way, we observed that neurology can reach many more individuals who carry out care consultations, quickly and safely through telemedicine. During the pandemic, it proved to be effective in keeping patients in their homes, especially the elderly, preventing SARS-COV2 and still guaranteeing the necessary medical care.[16] Therefore, telemedicine has proven to be a possibility for continued and comprehensive care in the post-pandemic context, given that medical and patient acceptance of this modality and greater technological accessibility allow for dissemination of this as early care throughout the world.[17]

Although the results of the studies above have demonstrated optimism, it is still necessary to validate this form of consultation with a certain level of scientific rigor, as there are still limitations such as general knowledge about the modality, the impossibility of a reliable physical examination and accessibility to resources that make online medicine viable. Also, it has been shown that not all neurological diseases benefit from telemedicine and developing countries and those with higher levels of poverty or lack of accessibility to health in general, such as Brazil, present some significant obstacles. Therefore, Santos et al.[18] demonstrate, for example, that a significant number of patients with parkinsonism are not accessible by teleconsultation or consultation, with a negative association observed in individuals with low education

In the landscape of neurologically complex healthcare, telemedicine has emerged as a vital tool, transcending geographical distances and facilitating access to specialized care. As defined by the World Health Organization, its application is crucial for overcoming physical barriers and providing diagnosis, treatment, and prevention of neurological diseases, as well as continuing education in healthcare. In Brazil, the progressive regulation of telemedicine, from 2002 to specific provisions during the COVID-19 pandemic, reflects the growing recognition of its importance, especially in neurology. The history of telemedicine in neurology traces back to its pioneering use in optimizing stroke care,[19-22] and today, with rapid expansion during the pandemic, its role extends to various neurological pathologies. Research demonstrates a significant shift in neurologists' behavior, with a substantial proportion migrating to telemedicine practice during the pandemic, illustrating its rapid adaptation and emergent necessity. However, challenges persist, especially in developing countries, where accessibility may be limited by socioeconomic and educational factors. Studies like that of Santos et al.[18] highlight disparities in accessibility among different population groups, underscoring the need for equitable approaches to ensure that all patients can benefit from the advances of telemedicine.

CONCLUSION

Telemedicine has become an indispensable tool in neurological practice, enabling more efficient and accessible care delivery, while challenging us to address accessibility gaps and ensure that its implementation is inclusive and equitable for all patients, regardless of their background or socioeconomic status.

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