Tratamento do pé torto congênito pela técnica de Ponseti: revisão integrativa

Treatment of congenital clubfoot using the Ponseti technique: an integrative review

Tratamiento del pie equinovaro congénito mediante la técnica de Ponset: una revisión integradora

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RESUMO

Objetivo: Evidenciar na literatura o tratamento do pé torto congênito pela técnica de Ponseti com foco em sua eficácia, fatores associados à recidiva e adesão. **Método**: revisão integrativa, conduzida no primeiro semestre de 2025, nas bases de dados Medical Literature Analysis and Retrieval System Online, Scientific Electronic Library Online e Literatura Latino-Americana e do Caribe em Ciências da Saúde. Procedeu-se à análise descritiva dos dados. **Resultados**: foram elegíveis 12 artigos. Os principais resultados apontaram que o método de Ponseti é o padrão ouro utilizado para o tratamento do pé torto congênito, utilizado pela grande maioria dos autores para o tratamento de seus pacientes, com poucos índices de complicações e com grandes índices de eficácia, porém o índice de recidiva é variável e está relacionado diretamente com a baixa aderência ao uso da órtese de Dennis Browne no período de manutenção. **Conclusão**: evidenciou-se que o método de Ponseti é eficaz quando executado de forma correta em todas suas fases.

Descritores: Pé torto congênito; técnica de Ponseti; tratamentos.

ABSTRACT

Objective: To highlight in the literature the treatment of congenital clubfoot using the Ponseti focusing on its effectiveness, factors associated with relapse, and adherence. **Method**: An integrative review was conducted in the first half of 2025, in the databases Medical Literature Analysis and Retrieval System Online, Scientific Electronic Library Online, and Latin American and Caribbean Literature in Health Sciences. Descriptive data analysis was performed. **Results**: 12 articles were eligible. The main results indicated that the Ponseti method is the gold standard used for the treatment of congenital clubfoot, used by the vast majority of authors for the treatment of their patients, with few complication rates and high efficacy rates, however, the recurrence rate is variable and is directly related to low adherence to the use of the Dennis Browne orthosis during the maintenance period. **Conclusion**: It was evidenced that the Ponseti method is effective when performed correctly in all its phases.

Descriptors: Congenital clubfoot; Ponseti method; treatments.

RESUMEN

Objetivo: Evidenciar en la literatura el tratamiento del pie equinovaro congénito mediante la técnica de Ponseti, con énfasis en su eficacia, los factores asociados a la recidiva y la adherencia al tratamiento. **Método**: Revisión integradora, realizada durante el primer semestre de 2025, en las bases de datos Medical Literature Analysis and Retrieval System Online (MEDLINE), Scientific Electronic Library Online (SciELO) y Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS). Se llevó a cabo un análisis descriptivo de los datos. **Resultados**: Fueron elegibles 12 artículos. Los principales resultados señalaron que el método de Ponseti constituye el patrón de oro para el tratamiento del pie equinovaro congénito, siendo utilizado por la gran mayoría de los autores en el tratamiento de sus pacientes, con bajas tasas de complicaciones y elevados índices de eficacia. Sin embargo, la tasa de recidiva es variable y está directamente relacionada con la baja adherencia al uso de la órtesis de Dennis Browne durante el período de mantenimiento. **Conclusión**: Se evidenció que el método de Ponseti es eficaz cuando se ejecuta correctamente en todas sus fases.

Descriptores: Pie equinovaro congénito; técnica de Ponseti; tratamiento

REVISÃO

Introduction

Idiopathic congenital clubfoot (ICCF) is a complex musculoskeletal deformity that affects approximately 1 in every 1,000 live births and is characterized by structural alterations in multiple planes, such as equinus, varus, forefoot adduction, and cavus1,2. Of multifactorial etiology and significant functional impact, ICCF requires early intervention to ensure proper gait development and the prevention of orthopedic sequelae[3,4].

The Ponseti method is currently considered the gold standard for the conservative treatment of this condition. It promotes progressive correction through serial manipulations and plaster cast immobilizations, followed by the use of a foot abduction brace during the maintenance phase5,6. The effectiveness of the method is well documented in the scientific literature, with success rates exceeding 90% in specialized centers, provided that the protocol is strictly followed[7,8].

However, relapses still represent a relevant clinical challenge, frequently associated with discontinuation of brace use, socioeconomic barriers, caregivers' educational deficits, and failures in outpatient follow-up9-11. Recent studies also highlight the importance of professional qualification in the implementation of the method, as well as the role of multidisciplinary care and family support as fundamental elements for therapeutic success12-14. In this context, it becomes essential to understand not only the technical aspects of the Ponseti method but also the contextual factors that directly influence treatment adherence and outcomes.

Given the potential impacts on the quality of life of children with congenital clubfoot and the need for treatments and care aimed at improving the quality of life of children with this condition, investigating this topic becomes relevant. Furthermore, the topic is included in the Brazilian National Agenda of Priorities for Health Research15 and in the Sustainable Development Goals for 2030.

The objective of this study was to identify in the literature the treatment of congenital clubfoot using the Ponseti technique, focusing on its effectiveness, factors associated with relapse, and adherence.

Methodology

This is an integrative literature review (ILR), conceptualized as one of the most widely used review methods in Evidence-Based Practice (EBP). This method aims to gather and synthesize research findings on a specific topic or question in a systematic and organized manner, contributing to a deeper understanding of the investigated subject16-18.

For its development, the six stages that guide ILRs were followed: formulation of the guiding question, literature search or sampling, data collection, critical analysis of the included studies, discussion of the results, and presentation of the review16-18. The PICo mnemonic strategy was used, considering: P (patient/problem) = congenital clubfoot; I (Intervention) = Ponseti technique; Co (Context) = evidence in the literature regarding the treatment. Based on these considerations, the following question was established: "What evidence exists in the literature regarding the treatment of congenital clubfoot using the Ponseti technique?" The following databases were used: Medical Literature Analysis and Retrieval System Online (MEDLINE), Scientific Electronic Library Online (SciELO), and Latin American and Caribbean Health Sciences Literature (LILACS), accessed through the Virtual Health Library (VHL).

For the selection of descriptors, terms from the Health Sciences Descriptors (DeCS), Medical Subject Headings (MeSH), and uncontrolled terms (synonyms and keywords) were used. Therefore, the following terms were applied: "congenital clubfoot" AND "Ponseti technique" AND "treatment" OR "treatments".

The eligibility criteria included primary articles that considered exclusively the Ponseti technique as treatment, published in Portuguese, Spanish, and English, with full-text availability, no time restriction, and freely available online. The following were excluded: books, book chapters, ministerial documents, reviews (integrative, narrative, scoping, or systematic) that were not primary articles, editorials, and reflection studies. Duplicate studies were considered only once.

For the study selection process, two independent reviewers screened titles and abstracts, followed by full-text reading of the selected materials. For data extraction, a data collection instrument was used, consisting of the following variables: article title, authors, language, year of publication, databases, journal of publication, objective, method, and results.

Furthermore, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) checklist and flowchart were used to standardize the stages and data analysis.

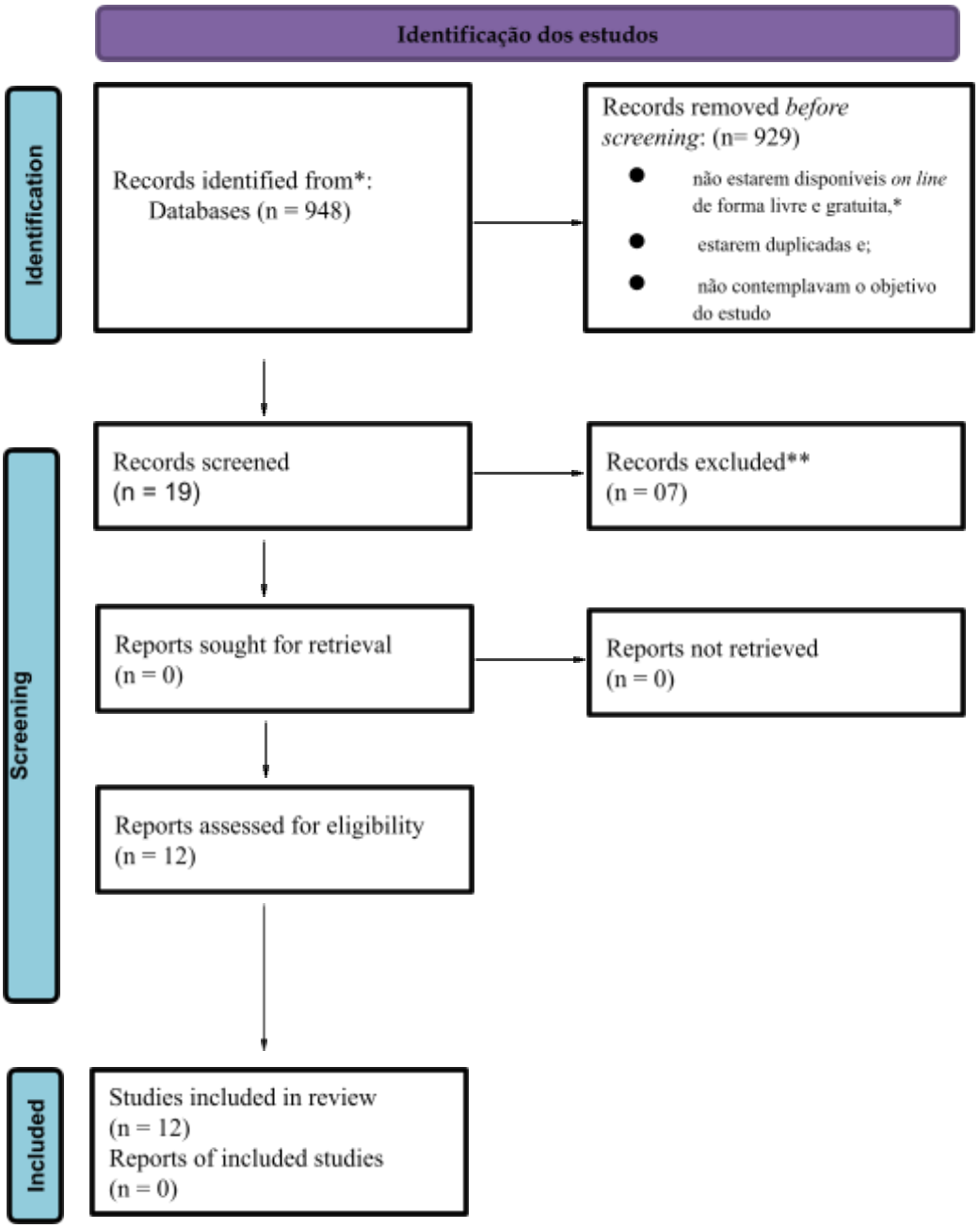
The data were analyzed qualitatively, considering the contents that emerged regarding the Ponseti Technique as the gold standard treatment for congenital clubfoot. Data analysis was performed through thematic categorization, grouping the findings into emerging analytical axes related to effectiveness, relapse, adherence, and comparison with other approaches. No formal assessment of the methodological quality of the studies was conducted, considering the heterogeneity of the included study designs and the objective of narrative synthesis.

As this was an integrative literature review using publicly available data, submission to a Research Ethics Committee was not required.

Results

Through the search strategy, 948 publications were identified. Of these, 929 were excluded because they were not freely available online, were duplicates, or did not address the objective of the study. Thus, 12 articles were included in the corpus of this review (Figure 1).

Figure 1. PRISMA flowchart adapted for the Integrative Review. Santa Maria, RS, 2025.



Source: Adapted from PRISMA, 2020.

Of the 12 included studies, four were indexed in SciELO, five in MEDLINE (PubMed), and three in LILACS. Six studies were published within the last five years (2020–2025). Table 1 presents information regarding the article title, language, database, journal of publication, author(s), year of publication, objectives, and method of the eligible studies.

Table 1. Articles that constituted the analysis corpus. Santa Maria/RS, 2025. (Note*: The JdeP/Vancouver style uses tables without vertical lines.*)

ID /	TITLE	Journal / Authors	Year / Database	Language		Objective	Method
A1	Evaluation of early treatment of idiopathic clubfoot using the Ponseti method	Acta Ortopédica Brasileira/ Oliveira et al.	2023/ Scielo	Portuguese		To evaluate the effectiveness of early treatment of idiopathic congenital clubfoot using the Ponseti method.	Clinical trial
A2	Congenital Clubfoot - Is the Ponseti Method the Definitive Solution?	Revista Brasileira de Ortopedia/ Cordeiro et al.	2021/ Scielo	Portuguese		To discuss whether the Ponseti method represents the definitive solution for the treatment of ICCF.	Qualitative study.
A3	Functional and clinical results achieved in congenital clubfoot patients treated by Ponseti's technique	Revista Brasileira de Ortopedia/ Jaqueto et al.	2016/ Scielo	Portuguese		To analyze the functional and clinical results of the Ponseti technique.	Observational study
A4	Treatment of congenital clubfoot using Ponseti method	Revista Brasileira de Ortopedia/ Chueire et al.	2016/ Scielo	Portuguese		To evaluate the results of the Ponseti method in the treatment of ICCF.	Epidemiological study
A5	The Ponseti method for the treatment of congenital club foot: review of the current literature and treatment recommendations	International Orthopaedics/ Radler	2013/ Pubmed	English		To review recommendations regarding the Ponseti method and prevent relapses	Systematic review

A6	Ponseti method in the management of clubfoot under 2 years of age: A systematic review	PLoS One/ Ganesan et al.	2017/ Pubmed	English		To review the effectiveness of the Ponseti method and the causes of relapse.	Systematic review
A7	Factors influencing recurrence in clubfoot treatment with the Ponseti method in children under 5 years of age: a scoping review	J Pediatr Orthop B/ Portilla-Rojas et al.	2025/ Pubmed	English		To analyze factors associated with relapse of ICCF treated with the Ponseti method.	Scoping review
A8	Learning curve in Ponseti method - evolution in 5 year-intervals	Acta Ortopédica Brasileira/ Guerschman & Nogueira	2024/ Lilacs	Portuguese		To evaluate how professional experience affects the effectiveness of the method..	Cohort study
A9	Four years follow up in congenital talipes equino varus patients managed with Ponseti method	Acta Ortopédica Mexicana/ Gaytán-Fernández et al.	2021/ Lilacs	Spanish		To follow patients treated with the Ponseti method for four years.	Longitudinal descriptive study
A10	Adherence to the Ponseti method by family members as a determinant in the success of club foot treatment	Acta Ortopédica Mexicana/ Fortis-Olmedo et al.	2020/ Lilacs	Spanish		To evaluate the impact of family adherence on treatment success.	Clinical case study
A11	The classic: congenital club foot: the results of treatment	Clin Orthop Relat Res/ Ponseti & Smoley	1963/ Pubmed	English		To report the classic results of the Ponseti method.	Clinical case study
A12	Early recurrence of clubfoot after the use of the Ponseti method	J Bone Joint Surg Am/ Haft et al	2007/ Pubmed	English		To investigate the causes of early recurrence after treatment with the	Cross-sectional study

						Ponseti method.	

Discussion

The literature demonstrates that the Ponseti method is the gold standard for the treatment of ICCF. Jaqueto et al.7 demonstrated a 90.2% functional success rate, with a 65.5% improvement on the Pirani scale. Similar results were obtained by Chueire et al.2, demonstrating that the soft tissues presented less injury and more efficient correction. Gaytán-Fernández et al.8 observed satisfactory correction in more than 90% of the cases, which reported minimal or absent pain, and relapse in 27.27% of the patients. Garcia et al.21 reinforce the relevance of the Ponseti technique over the Kite method, with greater effectiveness and a lower number of cast applications.

The study by Oliveira et al.1 demonstrated that early initiation of treatment is associated with better clinical outcomes and greater family satisfaction. Hopwood et al.3 and Ganesan et al.4 recommend that casting should begin between 2 and 6 weeks of age to optimize results. Guerschman and Nogueira12 emphasize that the learning curve of the method directly impacts treatment effectiveness, considering that more experienced professionals correct the deformity with fewer casts and greater technical skill and efficiency.

The greatest challenge in the Ponseti method lies in the maintenance phase with the foot abduction brace (FAB), generally the Denis Browne brace. Studies such as those by Cady et al.9, Haft et al.10, and Zhao et al.11 demonstrate that the relapse rate is strongly associated with non-adherence to brace use, ranging from 8% to 56% depending on adherence and family care. Ganesan et al.4 point out that 78% of relapses occur due to improper brace use. Ponseti and Smoley5 had already reported relapses in up to half of the cases due to early discontinuation of brace use, mainly between 2 and 4 months after abandonment.

Furthermore, studies demonstrate that adherence to treatment depends on the understanding and motivation of parents and caregivers. Paulsen-Miller et al.14 identified that parents need to understand the process and effectiveness of treatment, in addition to being supported by professionals who provide clear instructions, motivation, and follow-up. Fortis-Olmedo et al.13 reinforce that success depends on family commitment. Portilla-Rojas et al.23 identify additional factors, such as the initial severity of the deformity, age at treatment initiation, malnutrition, neuromuscular disorders, and the absence of specialized centers, as important influences on relapse.

Cordeiro et al.19 highlight that relapses manifested by rigidity require surgical interventions, including soft tissue release, osteotomies, tendon transfers (such as anterior tibial tendon transfer), bone resections, and corrective arthrodeses. Radler20 argues that the surgeon's experience and the early detection of signs of relapse are essential to avoid more complex invasive procedures.

The Ponseti method is widely recognized as the gold standard for the treatment of ICCF. According to Herzenberg et al.6 and Hopwood et al.3, its effectiveness reduces the need for extensive surgeries and ensures long-lasting results, provided that the protocol is fully followed. Saini et al.22 confirm that the method reduces invasive procedures, provides good functional outcomes, and is highly safe.

Conclusion

The analyzed literature demonstrates that the Ponseti method is the treatment of choice for ICCF. Its effectiveness, safety, and reproducibility consolidate it as the global therapeutic standard. However, its success depends on strict adherence to the protocol, especially during the maintenance phase with the foot abduction brace. Investing in professional training, family education, and continuous support is essential to prevent relapses. Public policies and structured follow-up programs should be encouraged to ensure that every child with clubfoot has access to complete, humanized, and effective treatment.

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