

# Thoracolumbar fascia in children with hemiparesis: analysis of two cases

**Keywords:** fascia, children, hemiparesis, cerebral palsy

**Abbreviations:** TLF, thoracolumbar fascia; CP, cerebral palsy

## Background

Hemiparesis is one of the possible topographic compromises in cerebral palsy, being spasticity in the hemibody its main characteristic.<sup>1,2</sup> The increase of the mechanical tension can influence the structural, functional and biochemical fascia composition.<sup>3</sup> Now, the thoracolumbar fascia (TLF) is the interface that connects the lower limb with the upper limb contralateral, giving an important role in walking,<sup>4</sup> breathing,<sup>5</sup> stabilization of the spine<sup>5,6</sup> and load transfer.<sup>7-11</sup> However, studies that have reviewed the characteristics of TLF in children with hemiparesis are non-existent.

## Objective

To describe the structural characteristics of TLF in children with hemiparesis.

## Methodology

Ultrasound was taken of the TLFs from both the apparently healthy and the affected side in 2 children (as), aged 8 and 10 years old, through the Philips iU22 device with a linear transducer located at 2 cm from the spinous process L2. Two variables were analyzed: thickness and echogenicity of the fascia. The study was approved by the ethics committee of the Faculty of Medicine of the National University of Colombia.

## Results

A variation in the thickness of the TLF of 67.96% and 34.32% was observed in the hemibodies of the participants, speaking of a possible fibrosis comparing the hemibodies, which may suggest a cause or consequence of the use or disuse of the same.<sup>12</sup> Likewise, there is a variation in the loose connective tissue, with a tendency to densify the TLF in two of the four intakes, which means a lower slippage of the fascial layers.<sup>13</sup> The echogenicity of the TLF showed a hyperechoic layer generating between homogeneous and heterogeneous ecotextures, which could correspond to infiltrations of the loose or adipose connective tissue in the TLF.<sup>14</sup>

## Conclusion

Ultrasound is a tool that allows to evaluate and diagnose the fascia, highlighting that the fascial system is involved in an integral movement distributed in myofascial chains, allowing ultrasound an approach to the tissue; therefore it complements the skill of the professional in the assessment of the individual.<sup>4</sup>

In children with hemiparesis, the structural characteristics of TLF are compromised in three of the four takings, which generate an antecedent to contemplate an integral view of the subject and a program with new alternatives strategies of intervention for children with cerebral palsy. The neuropsychiatric physiotherapy can benefit from the results provided by the ultrasound analysis in future studies

Volume 4 Issue 5 - 2019

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**Received:** September 22, 2019 | **Published:** October 11, 2019

in comparison of populations as well as the change of the fascia before an intervention in children with cerebral palsy.

## Implications

In children with cerebral palsy, the dysfunction is an alteration of the central nervous system.<sup>15,16</sup> Its evaluation and intervention involves an integral view that necessarily includes the fascial system, because it is a neurotransmitter, piezoelectric and tensegrity interface, so physiotherapy plays a vital card in the interaction of the child with cerebral palsy when including the fascial system.<sup>17,18</sup>

This is a pioneer study not only for involving the assessment and possible diagnosis of the fascia through ultrasound, but also because of its use in the pediatric population, since from our understanding there are no other studies about the evaluation of the TLF in the population pediatric.

## Acknowledgement

None.

## Conflicts of interest

The authors declare that there is no conflict of interest.

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