Anterior thorax cutaneous functional unit analysis of complete shoulder abduction movement in healthy 7 to 10 year old children

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ABSTRACT

Introduction: Cutaneous functional units (CFU) are predilected skin areas that determine the skin recruitment necessary for complete range of movement. Finding out the characteristics of CFU in healthy children, would allow for better diagnostics and prevent burn scar contractures.

Objective: To determine angular displacement of CFU in anterior thorax (AT), for complete shoulder abduction movement, in healthy children between 7-10 years of age.

Methods and Material: A descriptive study of 42 healthy children at COANIQUEM, Santiago 2011, was developed. Independent photographs were taken of each child in a neutral position and in maximal abduction range for both shoulders. AT length was measured, and a vertical line was drawn dividing the thorax into two hemibodies with ten symmetric spaces or percentage units (PU). Photographs were analyzed through double exposure with Photoshop CS3 Extended®. AT skin recruitment, elongation and angulation measures were obtained.

Results: While in upper extremity abduction, 59.5% of the children recruited AT skin up to PU 100 in the right shoulder, and up to 66.7% in the left shoulder, a non significant difference. Greatest AT skin displacement was produced at line four, while PU 50 achieved greatest elongation. Greatest angle displacement was observed at PU 10, with a meaningful difference between shoulders.

Conclusion: CFU of AT for complete shoulder abduction movement is wider in children than in adults. Skin tension is greater among PU’s from the central portion of the chest.

Key words: Cutaneous functional unit, percentage unit, skin recruitment, displacement angle.