

What's the best hip abduction angle for a supported-standing intervention? Answer with your ultrasound

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Background

Supported-standing interventions are commonly used and accepted in clinical practice, especially for children with cerebral palsy¹ (CP) and several benefits, such as hip stability¹ and enhancement of acetabular development², are suggested by literature. In the use of a stander, a clinical recommendation from evidence is to consider 30° to 60° of total bilateral hip abduction, based on tolerance, although the optimal amount of abduction has not been established³. The position of the femoral head relative to the acetabulum is usually measured by radiograph but can also be reliably assessed by ultrasound through lateral head distance (LHD) measurement⁴. To our knowledge, no studies were addressed to set-up the angles of hip abduction in supported-standing position using ultrasound.

Objectives

Identify the optimal amount of hip abduction using the LHD measurement in supported-standing position.

Methods

In 12 children and adolescents (mean age: 10,5 years – SD 4,03; 5 males) diagnosed with CP (GMFCS levels IV and V), ultrasound was used to measure LHD (the distance between the femoral head and the acetabular rim)⁴ in 2 different positions. LHD value was first determined in the supine neutral position (HP0), and then, with the children prepared on the stander in the horizontal position, LHD was monitored in real time during hip abduction. The angle showing the least LHD value was set-up as the supported-standing position (Abd-SS) and measured with a digital goniometer. LHD values in HP0 and Abd-SS were reported and hip abduction angles in the supported-standing position analysed.

Results

The LHD was measured in 22 out of 24 hips. Two hips were excluded because luxated. The mean LHD values were 2,04 mm (SD 3,17) and -0,95 mm (SD 2,38) in the HP0 and Abd-SS positions, respectively. An LHD value ≤ 0 indicates the complete coverage of the femoral head, as measured in the Abd-SS position. The descriptive analysis of angles in Abd-SS, showed a mean value of 18,62°

(SD 5,86), with a 95%CI 16,28-20,96. Interestingly, in 7/12 participants, the right and left abduction angles set up for supported-standing were not symmetrical. To our knowledge, a difference in abduction between the right and left hip in supported standing has not been reported in the literature to date.

Conclusion

Results confirm that ultrasound allows identification of the optimal amount of hip abduction, right and left independently, in a supported-standing position. This should be considered to enhance the quality and effectiveness of the supported-standing intervention.

References

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