



BREECH BABIES AND DDH RISK: ORTOLANI AND BARLOW TEST SENSITIVITY STUDY

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ABSTRACT

To determine if breech babies were at a higher risk for Developmental Dysplasia of the Hip (DDH), a professional conducted examinations on breech babies. The specificity and sensitivity of Ortolani and Barlow tests were also evaluated. A dedicated examiner, trained and tested by an orthopedic surgeon, performed a comprehensive examination of 170 babies. The results of this examination were not visible to a blinded examiner who assessed 30 babies, including five with positive tests. Additionally, a blinded radiologist examined thirty babies after Ortolani and Barlow tests, resulting in five positive findings. Routine examinations by examiners consistently yielded negative results for Barlow and Ortolani tests. The study found that two percent of babies born breech tested positive for Ortolani and Barlow tests. The findings suggest that conducting Ortolani or Barlow tests should be part of a routine hip examination by a hip specialist.

Key words: Breech babies, Developmental Dysplasia of the Hip (DDH), Ortolani test, Barlow test, Hip examination.

INTRODUCTION

A dislocated hip can be relocated using the Ortolani maneuver, involving abduction of the flexed hip with gentle anterior force [1], while the Barlow maneuver can identify a dislocated hip by applying a provocative maneuver [2]. However, systematic reviews suggest that Ortolani and Barlow tests may not consistently detect Developmental Dysplasia of the Hip (DDH) in early childhood [3]. Clinical examinations and ultrasound screenings are not universally offered, leading to challenges in identifying DDH cases [4]. Screening every baby using Ortolani or Barlow tests, especially if repeated or forcefully applied, may be unnecessary and costly. Ultrasounds may be required for babies at higher risk. Limited availability of skilled radiologists further complicates DDH screening efforts in some centers [5]. Studies indicate that experienced examiners are more likely to perform sensitive Ortolani and Barlow tests. A recent clinical study focused on comparing training and regular examiners in neonatal hip screening, particularly targeting breech babies, who are at higher risk for DDH

[6]. This study aimed to investigate DDH patterns specifically in the breech baby population.

METHODS AND MATERIALS

Participants who presented as breech at full term did not show differences in the method of delivery. The study excluded individuals with myelodysplastic syndromes, neurological disorders, or arthritis. Prior to the study, Primary Orthopedic Surgeons (POSS) trained an examiner on the Ortolani and Barlow test. A total of 30 babies underwent individual testing by both the POS and the designated examiner (DE). Both groups reached similar conclusions. One week after birth, 180 breech babies who presented on working days were screened as a result of the training. The blinded ward doctor also examined the breech and DE babies. The Graf technique 8 was used to perform ultrasounds on 30 babies by blinded radiologists. Hospitals notified their paediatric orthopaedic units when their blood test indicated a paediatric orthopaedic condition.

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RESULTS

According to the Ortolani-Barlow method, the designated examiner (DE) assessed 180 babies, of which 118 (65.6%) were females and 62 (34.4%) were males. The mean birth weight for babies weighing between 2.10 and 4.50 kg was 3.1 kilograms (SD: 1.53). Lower segment Caesarean sections (LSCS) accounted for 127 (70.6%) deliveries, while spontaneous vaginal deliveries comprised 53 (29.4%). Out of the 180 babies examined, 5 (2.4%) had positive Ortolani and Barlow results. Among them, five were female and one was male, with the majority of cases

involving left hips. All deliveries were performed via LSCS. Thirty subjects were included in the blinded group, but no positive Ortolani or Barlow tests were reported by the physicians on the blinded ward. Among the five infants with unstable hips (Ortolani and Barlow tests), only one did not exhibit instability. The sensitivity of the Ortolani and Barlow tests performed by trained examiners was 0.66 (95% CI: 0.284-1.000), and the specificity was 0.958 (95% CI: 0.888-1.000). No positive cases were identified in the second group (Table II), precluding the calculation of specificity and sensitivity.

Table 1: Ortolani and Barlow also perform ultrasounds on patients in addition to clinical exams

Ortolani and Barlow	Ultrasound positive	Ultrasound negative	Total
Test positive	5	2	7
Test negative	3	24	27
Total	8	26	34

Table 2: A medical officer's examination and an ultrasound are compared

Ortolani and Barlow	Ultrasound positive	Ultrasound negative	Total
Test positive	0	0	0
Test negative	7	25	32
Total	7	25	32

DISCUSSION

Ortolani and Barlow findings have been reported by various examiners, with this study suggesting that trained individuals are more likely to perform these tests reliably [7]. Moreover, the sensitivity of Ortolani and Barlow tests is reported to improve with successive attempts. However, the effectiveness of these tests relies on factors such as the relaxation of the baby, proper maneuver execution [8], and the examiner's ability to discern between a 'click' and a 'clunk'. While hips with normal function demonstrated high reliability, those with abnormal function showed moderate accuracy [9]. Notably, MRI without general anesthesia may not suffice for evaluating neonatal cartilaginous hips, which cannot be adequately assessed via plain radiographs or CT scans. Additionally, the low sensitivity of Ortolani and Barlow tests may contribute to low detection rates, as indicated by specialized examiners in this study reporting a sensitivity of 0.67, compared to 0.87 in another study. A robust screening method for developmental dysplasia of the hip (DDH) should ideally be highly sensitive, reproducible, easy to perform, and cost-effective. While Ortolani and Barlow testing meet some of these criteria, their low sensitivity has prompted some to advocate for ultrasound screenings, particularly for babies at high risk for DDH [10], such as those with breech presentation or a family history of the disease. However, the widespread use of ultrasound may be limited by cost and the availability of radiological equipment and expertise in certain countries. Thus, incorporating ultrasound into pediatric orthopedic surgery and pediatric education could enhance diagnostic capabilities. Breech presentation in

neonates is indeed associated with DDH, prompting screening efforts among this population [11]. A dedicated examiner trained in Ortolani and Barlow testing screened 180 babies, 66.9% of whom were delivered by breech presentation. Among breech babies delivered via lower segment Caesarean section (LSCS), only 2.4% showed positive Ortolani and Barlow test results. Notably, vaginal deliveries of breech babies were associated with a higher incidence of hip dysplasia compared to elective LSCS deliveries (1.1%). However, the incidence of DDH varied between studies, with ultrasound examinations revealing differing rates [12]. Additionally, it was observed that DDH assessment during the first week of life may not accurately reflect prevalence, as hip instability can persist for several months before spontaneously resolving with growth. Nonetheless, in this study, no false negatives were reported for the Ortolani and Barlow tests.

CONCLUSION

In conclusion, it is imperative to conduct Ortolani and Barlow tests during clinical screening of neonates, particularly those born breech. These tests play a critical role in identifying developmental dysplasia of the hip (DDH) at an early stage, allowing for prompt intervention and treatment if necessary. In a recent study, a trained examiner performed these tests on 2.8% of neonates born breech, highlighting the importance of targeted screening for high-risk populations. By incorporating Ortolani and Barlow tests into routine screenings, healthcare professionals can effectively detect hip dysplasia and mitigate potential long-term complications. This

underscores the significance of comprehensive clinical assessments in ensuring the health and well-being of newborns.

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