

# COMPARISON OF CLINICAL AND ULTRASOUND EXAMINATION FOR NEONATAL HIP SCREENING PROTOCOL FOR DETECTION OF DEVELOPMENTAL DYSPLASIA OF HIP – A HOSPITAL BASED CROSS-SECTIONAL STUDY

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## BACKGROUND

Developmental dysplasia of hip (DDH) is a spectrum of disorders, including subluxation and dislocation, affecting proximal femur and acetabulum. If not diagnosed and treated in time, it can lead to severe disability/deformity. In the screening of neonates for DDH, clinical examination and hip ultrasonography (USG) are the two most frequently used methods. This, combined with the fact that breech presentation, which has a strong association with DDH, has a high incidence of 7% at 32 weeks of pregnancy in India (as of 2018) makes it a prerogative to establish a national screening protocol.

## OBJECTIVE

To study the sensitivity and specificity of clinical examination for detection of DDH, with ultrasound as the reference standard, in order to establish a national screening protocol especially for breech presentations.

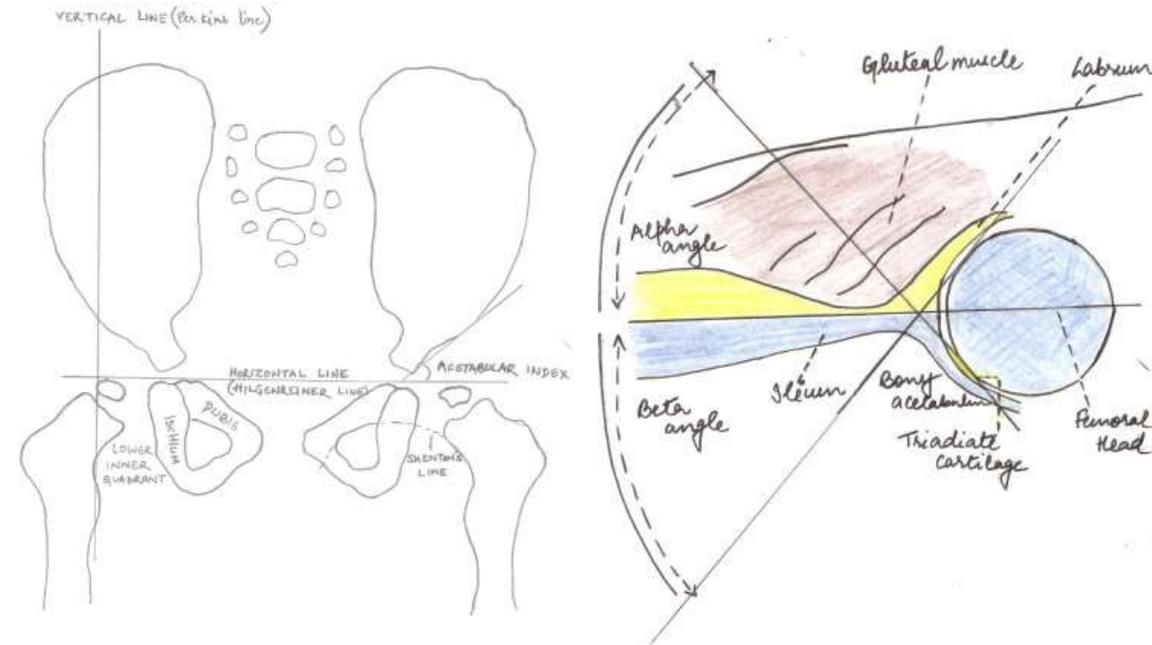


Fig. 1: X-ray and USG interpretation of DDH

# METHOD

Sample size= 75

Babies referred with risk factors of DDH from January to December 2017

Repeated Clinical Examination

If positive:  
Included in study

If negative but  
USG positive:  
Included

Repeated Ultrasound examination

If positive: Included

If negative: Excluded

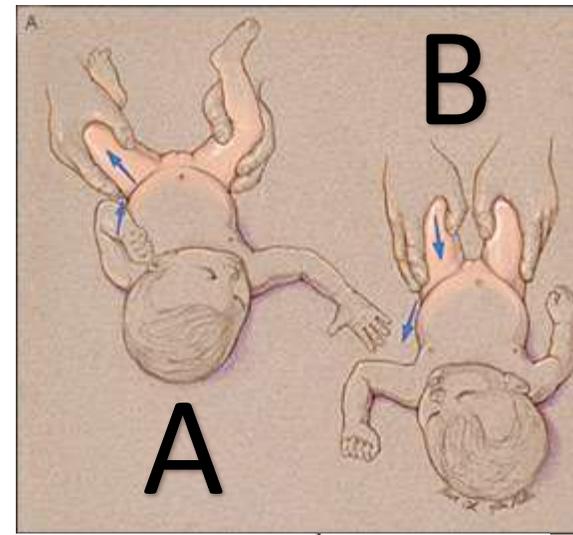


Fig. 2: (A) Ortolani and (B) Barlow maneuver

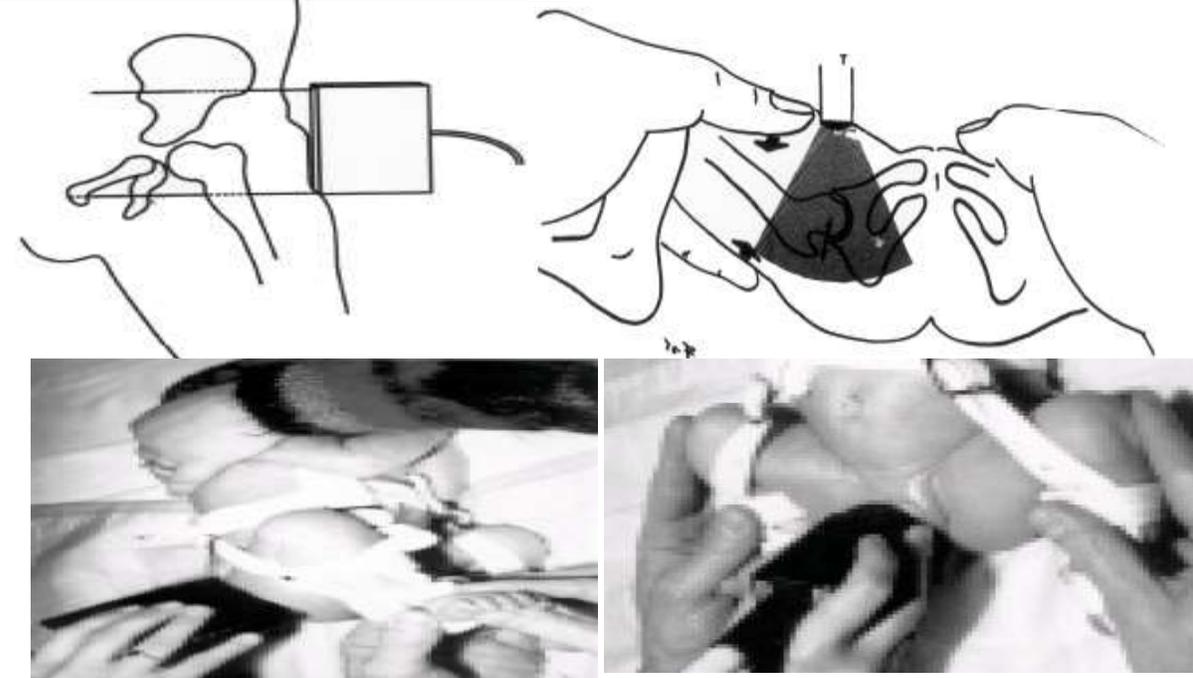
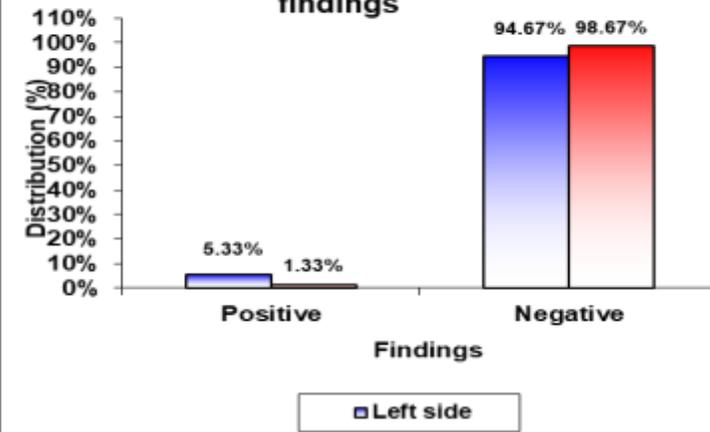
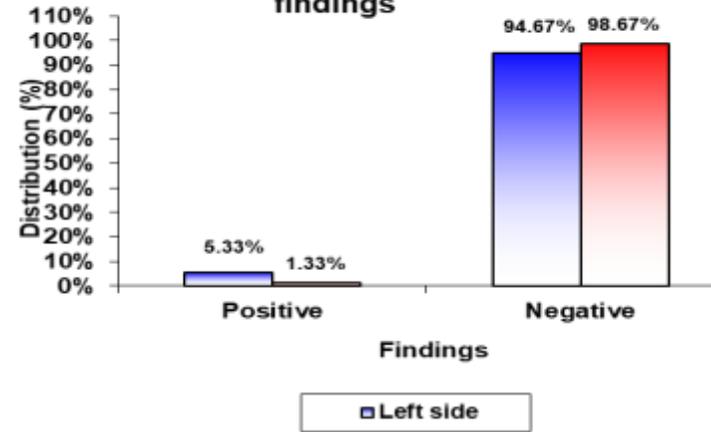


Fig 3: Position for USG scanning in coronal and transverse planes

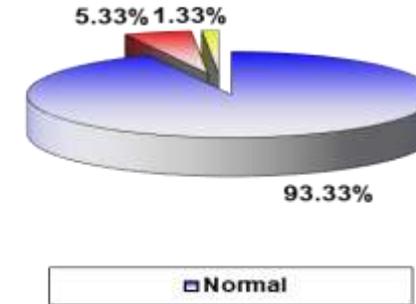
**Graph 1. Distribution of children according to the Barlow's test findings**



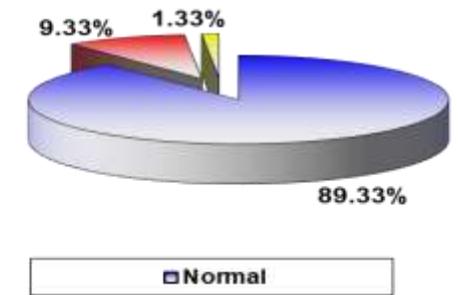
**Graph 2. Distribution of children according to the Ortolani's test findings**



**Graph 3. Distribution of children according to the clinical diagnosis of DDH**



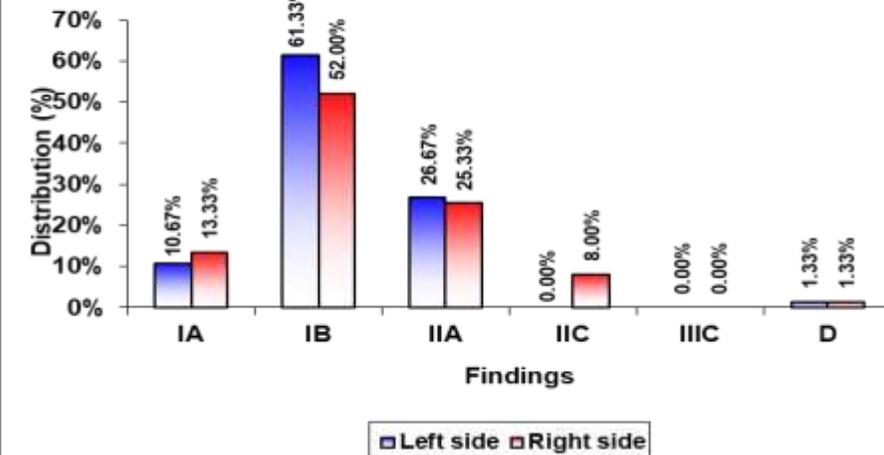
**Graph 4. Distribution of children according to the diagnosis of DDH based on USG**



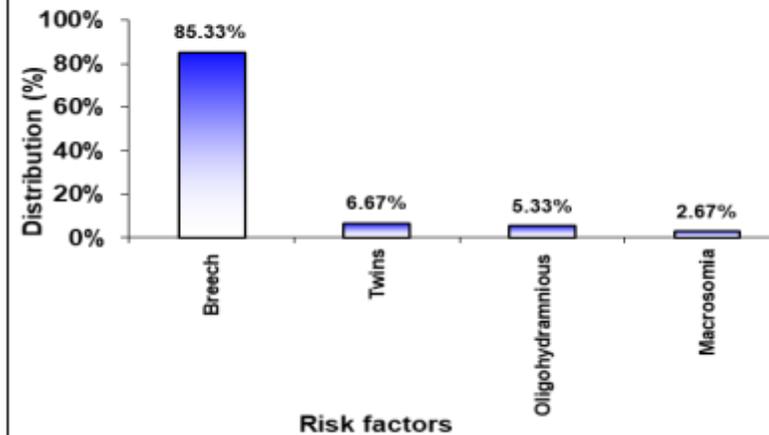
## RESULTS

**75 newborns** were studied by clinical examination and USG (Graf's method). **85.33%** of these babies were born in breech presentation. **10 hips** of 10 babies were diagnosed to have DDH based on USG, out of which, **8** were breech. Among these 10, **6 (all breech)** had a clinical diagnosis of DDH. Hence, **4 babies (2 breech)** went **undiagnosed** on clinical examination.

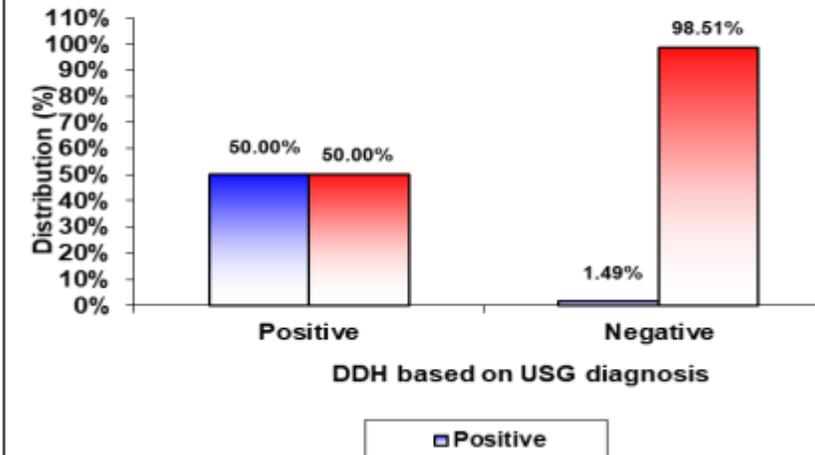
**Graph 5. Distribution of children according to the Graf test findings**



**Graph 6. Distribution of children according to the risk factors**



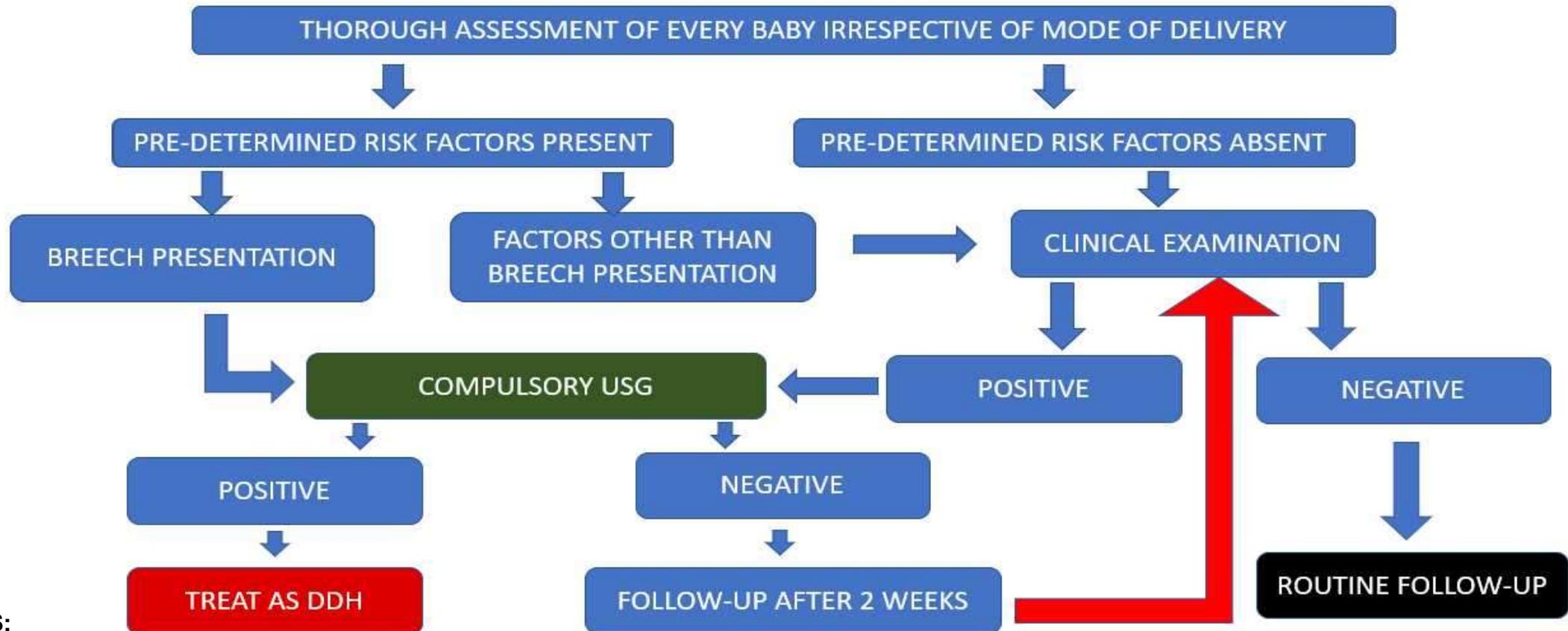
**Graph 7. Accuracy of clinical diagnosis considering USG as standard of reference**



# CONCLUSION

The **sensitivity, specificity, Positive and Negative Predictive Value** of clinical examination, considering USG as gold standard, was found to be **50%, 98.51%, 80% and 4.29%**. Hence, despite the high specificity, the low sensitivity of clinical examination makes a strong case for the use of USG in neonatal hip screening for diagnosing DDH, at least in high risk cases such as breech presentation. A screening protocol was drawn up accordingly.

## PROPOSED NATIONAL SCREENING PROTOCOL



### REFERENCES:

1. Kotlarsky P, Haber R, Bialik V, Eidelman M. Developmental dysplasia of the hip: What has changed in the last 20 years? World J Orthop 2015; 6(11): 886-901.
2. Gulati V, Eseonu K, Sayani J, Ismail N, Uzoigwe C, et al. Developmental dysplasia of the hip in the newborn: A systematic review. World J Orthop 2013;4(2):32-41.
3. Barlow TG. Early diagnosis and treatment of congenital dislocation of the hip. J Bone Joint Surg 1962;44B: 292-301..