Developmental Dysplasia of Hip: Role of Clinical Examination

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Abstract
Objective: The study was conducted to highlight the importance of screening every newborn to minimize the late presenting Developmental Dysplasia of Hip.

Patients & Methods: In six months duration 513 neonates were screened in Paediatric Nursery Department at Pakistan Institute of Medical Sciences by clinical examination and the findings were confirmed by a consultant orthopaedic surgeon.

Results: Out of 513 neonates, 15 were suspected to have congenital hip dislocation. An acetabular index of 30 degrees or more was considered dysplastic. 2 out of 513 neonates were confirmed as dysplastic hips.

Conclusion: This study indicates the need to establish a well-organized screening programme with experienced examiners which will be useful in making early and accurate clinical diagnosis.

Keywords: Developmental Dysplasia of Hip (DDH), Dislocation, Ultrasonography,

Introduction
The developmental dysplasia of the hip (DDH), previously labeled congenital dislocation of the hip (CDH), is a complex and difficult issue. It consists of subluxation to complete femoral head dislocation and acetabular dysplasia during early growth and development.¹ In this contrast a hip may be dislocated, dislocatable (but in a normal position at rest), subluxed (incomplete contact between the femoral head and acetabulum), subluxable (incomplete contact induced with provocative maneuvers), or appear normal on examination yet have an abnormally shaped acetabulum or femoral head radiographically. Therefore previously used term, “congenital hip dislocation,” has been abandoned in recognition of this spectrum, recognizing as well the fact that a child may have normal examination findings at birth but progress to dislocation later in life. Dysplasia comprises a complex disorder, which occurred during growth and development of the hip in which femoral head; acetabulum and joint capsule are vigorously involved resulting in deformations. It is essential to detect the disorder earlier because restoration of the normal relationship between the femoral head and acetabulum increases the possibility of normal development during remaining growth. Therefore, the incidence of this disorder reported from 188 per 1000 to 0.1/1000 and 0 in Cnadian Indians, Hong Kong and African Natives respectively.² In our country where health facilities are inadequate and ultrasonography cannot be done in every newborn and the actual incidence of dysplastic hip cannot be reported. Carter and Wilkinson mentioned an overall incidence of one per 1,000 live births, with one in 600 girls and one in 4,000 boys having the disorder.³ Increase in incidence is reported when ultrasonography is also used in addition to clinical examination.⁴ But with clinical screening only, the late dislocation rate is reported between 0.5 and 0.8 per 1000 live births.⁵,⁶

The city of Islamabad with the population of around 1.67 million according to 2011 survey has 10 public sector hospitals out of which Pakistan Institute of Medical Sciences is the largest tertiary care hospital, but due to heavy burden on the limited available infrastructure, it is difficult to examine every newborn using ultrasonography. This results in late presentation of DDH even up to the age of 9 years allowing the treatment to get difficult and complicated. So the study was conducted to highlight the importance of screening every newborn to minimize the late presenting DDH.

Patients and Methods
A prospective, hospital based observational study was conducted at Pakistan Institute of Medical Sciences, Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad. Screening of neonates for 6 months (from 1st December 2014 to 31st May 2015) was performed by an orthopaedic resident in Paediatric Nursery Department. All neonates admitted in the Paediatric Nursery Department were included in the study. The study was approved by the institutional ethical committee and by the Paediatric Department with the consent of the parents to examine the neonates. A proforma was designed including the basic information of the neonate; family history; associated disorders; and examination findings.

Total 513 neonates were screened for DDH by using Ortolani and Barlow maneuver. Through Ortolani test, the dislocated hip was relocated by flexion and abduction and a click sound was observed.⁷ Through Barlow test, an

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unstable hip was dislocated by flexion and adduction and a clunk sound was noticed. Other signs, such as shortening of the femur with hips and knees flexed (Galeazzi sign), asymmetry of the thigh or gluteal folds, and discrepancy of leg lengths were also noted. Positive results were confirmed by using ultrasonography and orthopaedic consultant examination. Data analysis was completed using SPSS software.

**Results**

As shown in Fig 1, majority of the neonates were males and born via C-section (Fig 2). Table 1 shows the categorization of study subjects on the basis of size. Positive findings for DDH were shown by 15 out of 513 neonates with only 3 of them showed alone Ortolani positive, 3 showed alone Barlow positive and remaining 9 showed both Ortolani and Barlow positive on initial examination by orthopaedic resident. Initial ultrasonography showed DDH in 2 out of 15 neonates. 4 out of 15 neonates died during first month. After 3 months follow up, the remaining 11 were examined by consultant orthopaedic and x-rays of the hip joint was carried out. 2 neonates (both male) were diagnosed as DDH, one having right sided DDH with Acetabular Index of 38°on x-rays and α angle of 49° and β angle of 77° with ultrasonography.

![Gender Distribution](image)

**Table 1: Categorization of Study subjects on the basis of weight**

<table>
<thead>
<tr>
<th>Weight (Kg)</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>32 (6.23)</td>
</tr>
<tr>
<td>1-2</td>
<td>202 (39.37)</td>
</tr>
<tr>
<td>2-3</td>
<td>145 (28.26)</td>
</tr>
<tr>
<td>3-4</td>
<td>120 (23.39)</td>
</tr>
<tr>
<td>4</td>
<td>14 (2.72)</td>
</tr>
</tbody>
</table>

This neonate was also having Down syndrome with tetralogy of fallot and imperforate anus for which colostomy was made. No family history of DDH, also the neonate was first child. Second neonate had bilateral DDH with acetabular index of 35° on right side and 36° on left side with no family history. Both neonates were treated with hip spica.

This study was conducted to highlight the importance of screening every newborn to minimize the late presenting DDH. The neonate’s hip clinical examination is a part of neonatal and infantile clinical routine examination but is not always adequate in diagnosing DDH alone. As some dysplastic, unstable, subluxated, or dislocated hips particularly if examined by an inexpert person, the diagnosis cannot be made or a normal hip may falsely be considered pathologic (false positive). In our study more than half of the total neonates were males and also more than half of the neonates were born through C-section. In spite of effectiveness of ultrasonography in diagnosing DDH many studies reported that if ultrasonography done in the first days after birth may leads to false positive results due to joint capsular laxity. Studies showed that physical examination should be delayed until after the newborn period due to high rate of spontaneous stabilization in the first four weeks of life. Hadlow reported that 50% of unstable hips at births stabilized entirely in 5 days. Barlow reported that 90% of unstable hips at birth become normal by 2 months; while Abidinejad et al. noted that 97% unstable hips spontaneously resolved by 6 months. It is certain that ultrasonographic examination for the screening of DDH has a high value, but the clinical examination performed by a skilled orthopedic surgeon is more satisfactory in primary screening for DDH in developing countries for early detection, due to poor health facilities. But if the newborn has a risk factor like; breech presentation, first delivery, sibling, female gender, oligohydramnios, torticollis, plagiocephaly, pes calcaneovalgus, calcaneovalgus, cesarean section, talipes equinovarus, generalized laxity, absence of flexion in knee and hip, low birth weight (< 2500 g), prematurity (before 37 weeks), restricted hip abduction, asymmetrical gluteal folds, wide perinea, and use of swaddling or is suspicious on clinical examination, it will be necessary to get assistance from ultrasonography by an experienced sonographer. Current United Kingdom programme recommends ultrasound screening of high risk infants at six weeks.

**Conclusion**
DDH is a disorder ranging from mild acetabular dysplasia to irreducible hip dislocation. For early diagnosis screening programmes vary worldwide depending upon the health facilities. In a developing country where health facilities are limited, physical examination has a high value in detecting early DDH and reducing late presentation of dysplastic hips.

Conflict of interest
This study has no conflict of interest declared by any author.

References