

Congenital Dislocation of the Hip in Newborns in the City of Mashhad

G. H. Mamouri, F. Khatami, A. B. Hamedi

Abstract

Background: Developmental dysplasia of the hip (DDH), formerly known as congenital dislocation of the hip (CDH) is a common congenital malformation which occurs worldwide with variable frequencies in respect to the race and geographic distribution.

Objective: To determine the incidence of DDH, its predisposing factors and the diagnostic value of click for its detection.

Methods: In a cross-sectional study of over 9-month duration, all of neonates born in the four teaching hospitals of Mashhad were examined during 48 hours after birth by Ortolani test. For all newborns with unstable joints, data regarding maternal history were collected. If clunk was felt on the first examination or click on repeated examinations, sonography was performed for more accurate diagnosis. All infants with definite CDH or unstable hip was referred to orthopedic clinic.

Results: A total number of 6576 newborns were examined over a period of nine months. Clunk or click was found in 3% (197 neonates). Only 10 newborns had CDH by clinical and sonographic findings. Of these, eight had clunk at birth and two had persistent click on repeated examinations. These were finally diagnosed as CDH. Eleven neonates were born in breech position. CDH was bilateral in 60% of patients, and solely left-sided in 30%. The incidence of congenital dislocation of the hip was 1.5/1000. There was a significant association between the first parity and CDH ($p < 0.05$), but not with maternal age.

Conclusion: The incidence of CDH in the sample studied (1.5/1000) is similar to other studies reported so far. Many of unstable hips showed no abnormality or click on repeated examinations and were thus of no value in diagnosis of CDH.

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Keywords • Dislocation • hip • infant, newborn

Mashhad University of Medical Science,
Ghaem Hospital, Mashhad, Iran.

Correspondence: G. H. Mamouri M.D.,
Mashhad University of Medical Science,
Ghaem Hospital, Mashhad, Iran.
Tel/fax: +98-511-8417451
Email: GH-mamouri@yahoo.com

Introduction

Congenital dislocation of the hip (CDH) is one of the most common neonatal disorder. This formerly used terminology is now being replaced by the preferred description DDH (Developmental Dysplasia of the Hip).¹ Early diagnosis and appropriate treatment in the neonatal period leads to a better functional

Maternal age	Abnormal hips		CDH		Total of newborns	
	No	Percent	No	Percent	No	Percent
<20	48	24.3	1	10	1216	18.5
21-25	50	25.3	4	40	2018	30.5
26-30	64	32.4	3	30	1914	29
31-35	119	9.6	1	10	986	15
>35	16	8.1	1	10	442	7
Total	197	100	10	100	6576	100

outcome rather than what can be achieved by diagnosis and treatment at a later stage. Detection of congenital dislocation of the hip by clinical examination was first described in 1937 by Ortolani.² At present, Ortolani and Barlow's tests are the basis for clinical screening of DDH in newborns.^{3,4} Despite a normal birth the normal neonate especially when burdened with risk factors, can benefit from primary screening followed by repeated hip examinations during the first year of life, for the diagnosis of late CDH.³ This study was intended to determine the incidence of CDH in Mashhad and to determine the incidence of CDH, its predisposing factors and the diagnostic value of click for its detection.

Patients and Methods

In a prospective study of over 9 months, a total of 6576 newborns were examined in four hospitals (Ghaem, Emam Housein, Emam Hadi, Musabne Jaafar).

Each newborn was examined during the first 48 hrs after birth by one of the authors. The diagnosis of DDH in infants with suspected abnormal hips was based on Ortolani test, Barlow test or limitation of hip abduction. For all infants with unstable joints, relevant data were collected regarding maternal history; the type of delivery, birth order, associated abnormalities or positive family history. If clunk (replacement of femoral head to the inside

acetabulum by Ortolani test) was felt, then sonography was performed for more accurate diagnosis and infants were referred to an orthopedic surgeon. If a click was felt on the first examination, triple diaper was advised and the infant examined again at second and four weeks, following the same algorithm.

Results

During the study, 6575 newborns were examined within the first 2 days of life. There were 3440 (53%) males and 3136 (47%) females. In 197 infants (30 in 1000 birth), clunks or clicks were felt on the first examination. From these infants with unstable hip joint, 110 (55.9%) were male and 87 (44%) female. Unstable hip was bilateral in 39% of cases; the left hip was involved solely in 34% and the right side in 27% of cases. Teratologic CDH was observed in one female infant. This infant had associated malformation (hydrocephalous and myelomeningocele) and was excluded from our study. Clunks were felt on the first examination in eight infants, in whom CDH was confirmed by sonography. CDH was diagnosed in two other infants on follow-up examinations.

From 10 cases with CDH, both hips were involved in 6, the left side in 3 and the right side in one infant only. Among 197 infants with unstable hip, 19 were premature, 170 term, and 8 post-term newborns. Twenty-one infants had low birth

Birth order	Abnormal hip		CDH		Total of newborns	
	No	percent	No	percent	No	Percent
1	61	41	7	70	2012	30
2	47	24	1	10	1677	26
3	27	14	2	20	1233	19
4	25	13	-	-	635	10
>5	16	8	-	-	1019	15
Total	197	100	10	100	6576	100

Congenital dislocation of the hip in newborns in the city of Mashhad

Table 4: Associated factors with CDH

Factor	No.	Percent
Female	7	70
First pregnancy	7	70
Breech	4	40
Familial marriage	4	40
LBW	1	10
Premature	1	10
General joint laxity	1	10
Familial history	-	-

weights. The methods of delivery in affected infants were vaginal in 160 and cesarean section in 37 infants. Breech presentation was seen in 11 (11/197); none was complicated by oligohydramnios. The relation of abnormal hips with birth order and maternal age is shown in Table 1, 2. There were significant correlation between first pregnancy and CDH ($P < 0.05$); the highest rate was found in mothers aged between 25-30 years. Other associated findings in newborns with CDH are shown in Table 3, 4.

Discussion

DDH encompasses a wide spectrum of hip disorders such as abnormalities of the acetabulum, femoral head and neck as well as, dislocated and dislocatable hips. It may be recognized radiologically in clinically normal hips.^{5,3,1} The etiology of DDH is multifactorial; genetic, hormonal and mechanical factors are involved.^{6,7,4}

Teratogenic dislocation occurs early in uterus and is associated with malformations of pelvis and femur. In this form, dislocated hip cannot be reduced by Ortolani maneuver. The femoral head grows disproportionately faster than surrounding cartilage, so that it is less than 50% covered at birth. Within a few weeks after birth, the acetabular cartilage develops more rapidly than the femoral head, resulting in progressively increased coverage. Therefore, during the last trimester of gestation and the first few months after birth, the hip is at highest risk for DDH.⁸

The prevalence of DDH varies according to racial and geographic parameters, being greater in whites than in blacks.

The incidence of hip dislocation and abnormal hip in neonates is approximately 1.3 per 1000 live births for CDH and 12 per 1000 for abnormal hip.⁴

Rosendhle reported that 1.5 to 2% of all neonates have clinically unstable hips at birth.⁹

It has been estimated that only 10% of these babies will have dislocated hips in later childhood if left untreated, while another 10% will show evi-

dence of dysplasia.⁹ Dunn evaluated 23000 newborns, and reported that 1.9% of all neonates had clinically unstable hip at birth.¹⁰

In a study of 9030 neonates, hip instability of 1.4% was reported at birth by sonographic screening. This screening detected more unstable hips than clinical examination.¹¹ Chan showed that clinical screening for CDH was successful in southern Australia.¹² The program included clinical screening at birth, before discharge and again at 6 weeks. In this program, only 2.4% cases of CDH were detected and required surgery after 3 months. If clinical screening is not done at birth, most cases of CDH will be detected later in infancy. In one respective study from Saudi Arabia (Aseer region) where neonatal screening is poor, most cases of CDH were diagnosed after 6 months.¹³ Incidence of CDH in this study was 3.5/1000 live births. In our study, prevalence of true CDH was 1.5 /1000 neonates, and prevalence of unstable hip was 30/1000 live births. In a study done by Abdinejad, the prevalence of dislocation of the hip and unstable hip were 2.5 and 185 /1000 live births respectively.⁵ The important risk factors for CDH are: female sex, primiparity, breech presentation, oligohydramnios^{14,15,7}, positive family history and metatarsus abductus. Taking these risk factors into consideration, up to 25 % of infants had unstable hips in one study.¹⁶ There has been no consistent finding regarding the month, season of birth, maternal age or birth weight.¹⁵ In our study, abnormal hip by Ortolani or Barlow test was a frequent finding, but we found that simple click was not a pathognomonic sign, since spontaneous resolution was observed on later examinations. The female preponderance of unstable hips has been recognized by many observers.^{14,17,15} In our study, 56% of unstable hips and 70% of CDH occurred in females. The increased incidence of DDH in breech delivery is well known. Between 11-50% of infants with DDH had a breech presentation compared with 3-4% in general population.^{3,15} There was a breech delivery in 5.6% of unstable hips and 40% of infants with true CDH. The increased incidence of unstable hips has been recognized in the first parity by many authors.^{5,3,18} Chan reported that primiparous women have more than twice the risk of DDH, compared with mothers of parity 2 or more.¹⁵ We found an incidence of 41% in first parity for unstable hips and 70% for CDH. Unstable hips occurred in mothers with 5 or more deliveries. The left side is involved much more commonly than the right. DDH is bilateral in 20-24%.^{3,7} In our study of 197 infants with unstable hips, in 34% there was involvement of the left side, 27% of the right side and in 39% both sides were involved and true bilateral CDH was present in 60%. Preterm birth and low birth weight both re-

duce the risk of DDH.¹⁵ Physical examination at birth is an important method for detection of DDH. Simple click, commonly misinterpreted as a sign of instability, almost disappears on subsequent visits in the majority of newborns. Radiographic evaluation is shown to be an insensitive method for detecting DDH at first weeks. Sonography in addition to the clinical examination is a useful diagnostic test for DDH and is preferred before 4 months of age.^{3,19,18,7,9} If the neonatal examination is normal at birth, repeat hip examination at 2 weeks, and after 2,4,6,9,12 months of age is recommended.³ There has been discussion about false positive result of sonography, but it remains a reliable method if done by experienced sonographer. In our study, all cases of CDH had positive sonographic findings. In the neonatal period treatment by using abduction devices is generally successful.² In cases with a click hip or an equivocal examination, evaluation should be done with ultrasound at 2 to 6 weeks of age.¹⁸ Some authors believed that swaddling may increase the risk of CDH but there has been no correlation between infant wrapping and DDH.^{5,19} We advise triple diaper for neonates with a simple click and normal sonography and repeated examination at 4 weeks.

Conclusion

Congenital dislocation of the hip (DDH) must be regarded as an important health problem, leading to pain, loss of mobility and limbs shortening. Unstable hips can be diagnosed in newborns with simple methods. Most clicks seen in early neonatal period disappear at a later neonatal period, and some babies with dysplasia, are normal at birth and may be diagnosed in infancy or later age. In this study, frequency of CDH was similar to other reports.

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