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Original Research Article

Evaluation and Management of Developmental Dysplasia of Hip (DDH) in Children - Our Experience

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Abstract: ***Introduction:*** DDH is the most common congenital anomaly of the musculoskeletal system in newborns. The disease ranges from a simple flattening of the acetabular cavity to the complete dislocation of the femoral head. Most developed countries report an incidence of 1.5 to 20 cases of DDH per 1000 births, depending in part on the methods of screening used. It includes a wide spectrum of hip alterations: neonatal instability; acetabular dysplasia; hip subluxation; and true dislocation of the hip. ***Aim of the Study:*** The aim of this study was to evaluate the management of the Developmental Dysplasia of Hip (DDH) in children. ***Methods:*** This retrospective study was conducted in the Department of Pediatric Surgery, Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh during the period from January2018 to December 2021. ***Result:*** In total 54 neonates completed the study. In our study we found majority (53.70%) of children were aged less than 4 months old. Followed by 25.93% & 20.37% were aged 1-2 months & 3-4 months respectively. Majority of neonates were girls (61.11%) compared to boys (38.89%). The highest risk factors of DDH was breech presentation (19%).We found that majority of neonates (70.37%) had dysplasia on left side and 7.41% had dysplasia on right side respectively. The prevalence of bilateral condition was 12(22.22%). ***Conclusion:*** DDH a common congenital anomaly that can be successfully treated non-operatively if detected early. For older individuals with dislocated or unstable hips, surgery is necessary. Surgery's function in treating acetabular dysplasia in children is changing and largely determined by symptoms. Expanding therapy choices for DDH and improved anatomical patient assessment skills among doctors will result in the proper intervention at the right time.

Keywords: Developmental Dysplasia of Hip (DDH), Children.

INTRODUCTION

Developmental Dysplasia of the Hip (DDH) is the most common congenital anomaly of the musculoskeletal system in newborns. It ranges from a simple flattening of the acetabular cavity to the complete dislocation of the femoral head [1]. DDH is a spectrum of anatomical abnormalities of the hip joint in which the femoral head has an abnormal relationship to the acetabulum. The true incidence of DDH can only be estimated because there is no ‘‘gold standard’’ for diagnosis. Most developed countries report an incidence of 1.5 to 20 cases of DDH per 1000 births, depending in part on the methods of screening used [2]. The term ‘developmental dysplasia of the hip’ (DDH) includes a wide spectrum of hip alterations: neonatal instability; acetabular dysplasia; hip subluxation; and true dislocation of the hip [3-5]. Looseness or laxity within the acetabulum is called instability [6]. In the case of dysplasia, some morphological changes in the acetabulum, proximal femur or both are present, but articular surfaces are concentrically in contact. In the subluxated hip, there is contact between both articular surfaces, but not concentrically. In a true dislocation,

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there is no contact between the articular surfaces of the proximal femur and acetabulum [7]. It is important to differentiate between these entities, because its clinical course, treatment and prognosis are also different. When facing a child with DDH, it is very important to determine whether the hip is concentrically reduced. Classical terms such as 'congenital dislocation of the hip' or 'congenital dysplasia of the hip' are used less often these days because they do not include the developmental aspect of the dysplasia, which is important from a medico-legal point of view [8]. The incidence varies with age at diagnosis, race, and modality by which diagnosis was made. DDH has a spectrum that ranges from mild hip instability, which resolves spontaneously to dislocation, which needs surgery. In a prospective study by M Kokavec & Bialik V, the sonographic incidence is about 69.5 per 1000, but most of them self-resolve in about 6 to 8 weeks, leaving 4.8 per 1000, which requires some form of treatment. No additional incidence was seen at age one [9]. The incidence varies from 0.06 in Africans to 76.1 per 1000 in Native Americans due to the combination of genetics and swaddling. Unilateral involvement in 63% and 64% involves the left side due to in utero most frequent fetal positioning (left occipitoanterior). The left hip of the fetus is adducted against the mother's lumbosacral spine [10, 11]. The etiology is multifactorial, with genetic, hormonal and environmental causes, but it is believed that the primary cause is restriction of the movements of the fetus or hyper elasticity of the joint capsule of the hip [12, 3]. The incidence of DDH with dislocation is around one in every thousand live births. It is more prevalent in children with pelvic presentation, females and children with a positive family history (12% to 33%) [12-15].

An early diagnosis, which is essential for an early treatment, is the fundamental prerequisite in order to achieve the best treatment results and to reduce the possibility of hip osteoarthritis in young adults. The treatment effectiveness is maximized when it begins early, within the first month or, if possible, the first days of life. If untreated, DDH can cause early hip osteoarthritis and, in the most severe forms, the presence of a limp with severe functional limitations, since walking age. The importance of early identification and adequate treatment for this disease is to prevent its sequelae, such as deformity of the femoral head, anteversion of the femoral neck, valgus thigh and dysplastic acetabulum, which evolve to hip arthrosis [1, 16, 17]. Hence in this study we aimed to provide recommendations for the early detection of hip developmental dysplasia (DDH) and indications on its management.

OBJECTIVE

The main objective of the study was to evaluate the management of the Developmental Dysplasia of Hip (DDH) in children.

MATERIALS & METHOD

This was a retrospective study and was conducted in the Department of Pediatric Surgery, Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh during the period from January, 2018 to December, 2021. A total of 54 cases of neonates having Developmental Dysplasia of the Hip (DDH) was taken for our study.

These are the following criteria to be eligible for the enrollment as our study participants: a) Neonates were included from birth to 4 months old; b) Neonates with having DDH; c) Neonates having clinically suspected of DDH incidentally; d) Neonates with written informed consent obtained from their parents. And a) Neonates with other hip joint disorders, b) Neonates with severe systemic diseases contraindicating surgical procedure; b) Patients with previous surgical history; c) Neonates with any acute illness (e.g., renal or pancreatic diseases, ischemic heart disease etc; d) Children with other systemic illnesses, (e.g., protein energy malnutrition and cerebral palsy) were excluded from our study.

Clinical Examination

It is crucial in the identification of DDH, especially babies with risk factors. Hip instability/dislocation can be identified by Barlow and Ortolani manoeuver.

Ortolani Maneuver

Infant in the supine position, hip flexed at 90 degrees and in neutral rotation. The infant should be calm, and clothes and diapers should be removed. This manoeuver reduces dislocated hip. The hip is held in the way the thumb on the inner aspect and index and ring finger on the greater trochanter. While applying anterior force on the greater trochanter, gently abduct the hip. If the hip dislocated, one would feel a jerk or clunk. "Hip clicks" are clinically insignificant without instability [19].

Barlow Maneuver

In the same above position, while applying posterior force to trochanter (AAP recommends against posterior force), adduct the hip. You will feel the clunk or jerk if the hip can be dislocated. This maneuver should be done gently as forceful adduction can cause instability. [20].

The sensitivity of this maneuver with experienced hands (ranging from 87 to 97 percent) and specificity varies from 98 to 99 % [21].

Asymmetry in the position and or the number of the gluteal skin folds may be a clue for DDH. But asymmetry is a normal finding in 27 % of infants. Galeazzi (Allis) sign identifies real or apparent of the femur, by comparing the knee height while hip and knee are flexed and feet flat on the table [22].

Evaluation

The POSNA, the Canadian Task Force on DDH, and the AAOS, the American Academy of Pediatrics, recommends periodic surveillance for DDH throughout infancy. The 2000 AAP clinical practice guideline recommended the hip ultrasound (USG) at six weeks of age or Xray of the hip at four months of age in girls with a positive family history of DDH or breech presentation at third trimester. Universal screening is controversial, as most of the instability is found self resolves [23].

Diagnosis depends on local resources and the availability of expert guidance.

Newborns

1. Normal exam with risk factors - USG hip at six weeks (allowing time for resolution of physiologic immaturity and laxity).
2. Inconclusive exam or hip clicks - Repeat exam in 2 to 4 weeks.
3. Positive Ortolani or Barlow - Refer to an orthopedic specialist with experience.

Four Weeks to 4 Months

1. Inconclusive exam - Refer to a specialist or Hip USG at six weeks.
2. Positive Barlow or Ortolani - Refer to an orthopedic specialist with experience [22].

Imaging

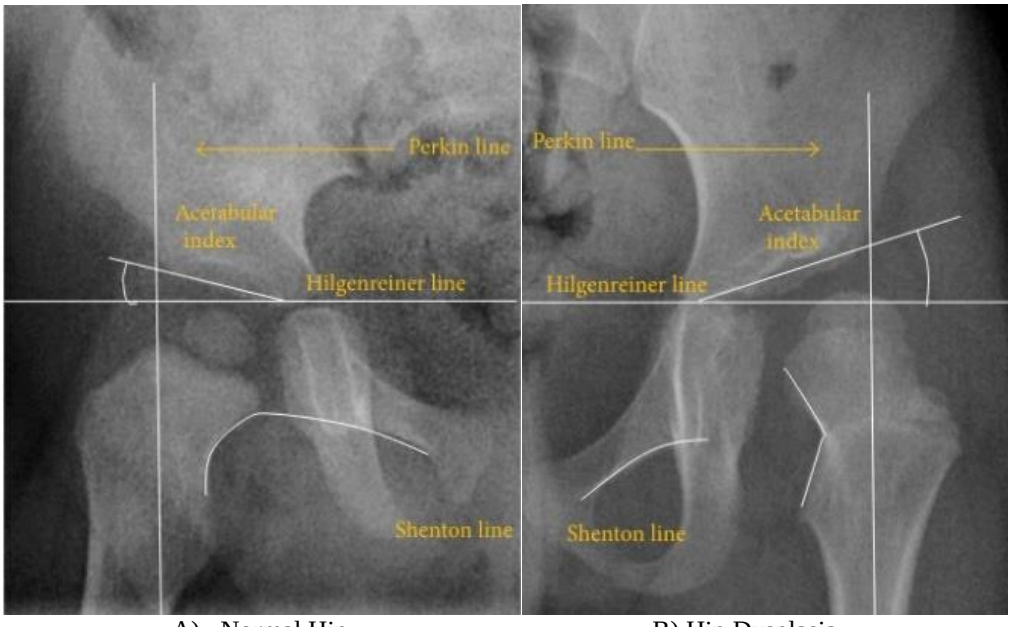
The American Institute of Ultrasound in Medicine and the American college of radiology recommend the USG of the hip [24]. It is used to visualize acetabular dysplasia, hip dislocation, femoral head anatomy, ligament teres, and hip capsule. The most important finding to know is femoral head coverage by acetabulum (minimum 50%) and depth of the bony acetabulum (Alpha angle: More than 60 degrees considered normal).Criteria for DDH has been established for static imaging (Graf classification).

GRAF Classification

1. Alpha angle-angle between bony acetabulum and Illium (Normal > 60 degrees).
2. Beta angle-angle between labrum and ileum (Normal < 55 degrees) [22].

Radiological Examination

Hip X-ray still plays a role in the diagnosis of DDH [33]. However, the method is useful only from the 3^{rd} – 4^{th} month of life of the child, when the skeletal structures reach a sufficient degree of mineralization and may be visualized by X-rays. The risks associated with radio exposure and the modest information that the examination provides in the first 3–4 months of life, have made this diagnostic tool no longer recommended as a screening test for DDH. Hip X-rays must be used as a second-level diagnostic investigation in order to: i) confirm a clinical or ultrasound suspicion of DDH; ii) as a follow-up the disease; iii) document the complete recovery of the most severe forms; iv) highlight the possible onset ofcomplications [1, 25].



A) Normal Hip B) Hip Dysplasia

Figure 1: Showing the pelvis X-ray of a (A) normal hip & (B) hip dysplasia [26]

Statistical Analysis

All data were recorded systematically and quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was performed by using SPSS 23 (Statistical Package for Social Sciences) for windows version 10.

95% confidence limit was taken. Probability value <0.05 was considered as level of significance.

RESULT

Table 1: Distribution of our study subjects based on demographic variables (n= 54)

Variables	N	P(%)	P-value
Age(months)			
<1 month	29	53.70	0.023
1-2 months	14	25.93	
3-4 months	11	20.37	
Sex			
Boys	21	38.89	0.042
Girls	33	61.11	
Weight(kg)			
Mean ±SD	4.02 ± 2.11		0.001
Height(cm)			
Mean ±SD	49.03 ± 3.41		0.001

Table 2: Distribution of study subjects based on the conditions of DDH

Conditions	*N*	*P(%)*	*P-value*
Bilateral	12	22.22	0.012
Unilateral			
Left side	38	70.37	0.015
Right Side	4	7.41	

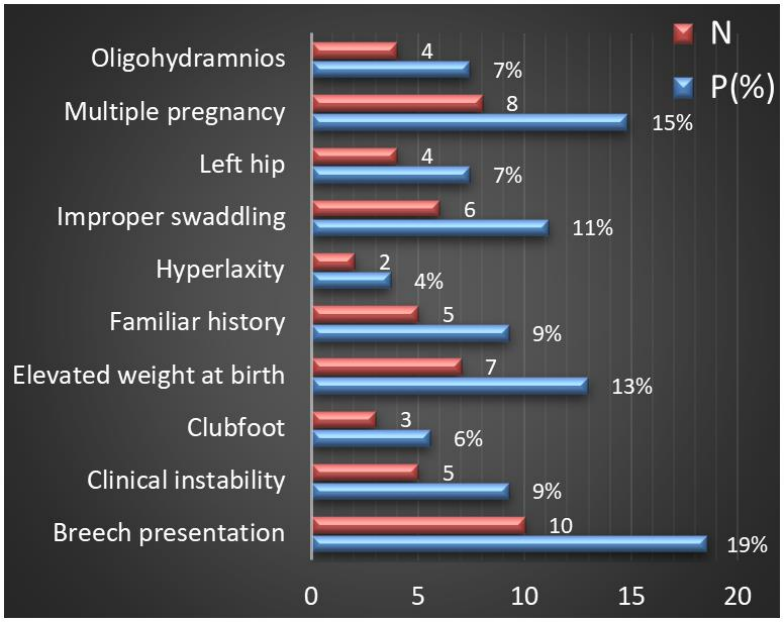


Figure 2: Distribution of study subjects based on the risk factors of DDH

In table 1 we showed the distribution of our study subjects based on demographic variables. Majority (53.70%) of children were aged between less than 1 month old. Followed by 25.93% & 20.37% were aged 1-2 months & 3-4 months respectively. Majority of neonates were girls (61.11%) compared to boys (38.89%). We found the mean ±SD of weight was 4.02 ± 2.11 kg and the mean ±SD of height was 49.03 ± 3.41 cm.

In figure 2 we distributed our study subjects based on the risk factors of DDH. Among all risk factors majority (19%) had breech presentation, followed by 15% & 13% had dysplasia because of multiple pregnancy & elevated weight at birth respectively. Both clinical instability & familiar history was found 9% and 7% was found in both oligohydramnios & left hip. The least prevalence 4% was found in hyperlaxity.

In table 2 we showed the distribution of study subjects based on the conditions of DDH. We found the highest prevalence of dysplasia was present in unilateral condition. Majority of neonates (70.37%) had dysplasia on left side and 7.41% had dysplasia on right side

respectively. The prevalence of bilateral condition was 12(22.22%) among 54 neonates.

DISCUSSION

In our study we found that majority (53.70%) of children were aged between less than 1 month old. Followed by 25.93% & 20.37% were aged 1-2 months & 3-4 months respectively. Majority of neonates were girls (61.11%) compared to boys (38.89%). We found the mean ±SD of weight was 4.02 ± 2.11 kg and the mean ±SD of height was 49.03 ± 3.41 cm. [Table 1] Geertsema *et al.,* they screened a total of 3536 neonates (7072 hips) at an age of two to three weeks [27]. Anastácio *et al.,* found that 19 (90.5%) were female and two (9.5%) were male in their study. The mean age at the time of diagnosis was 2.3 years; the earliest was at the age of one month and the latest was at 4.6 years [28].

In the current study among all risk factors majority (19%) had breech presentation, followed by 15% & 13% had dysplasia because of multiple pregnancy & elevated weight at birth respectively. Both clinical instability & familiar history was found 9% and 7% was found in both oligohydramnios & left hip. The least prevalence 4% was found in hyperlaxity [Figure 1]. Lambeek *et al.,* found breech position in the last trimester being the most significant risk factor for DDH. The odds ratio is 5.47 (2.58 to 11.6). The procedures that decrease the time spent in the breech Position, like the external cephalic version and pre-labor CS, reduce the risk for DDH [29]. Robert *et al.,* & Stevenson *et al.,* Many genes have postulated in the Asian population. The relative risk is 1.72 (0.05 to 55.00). The risk of recurrence is high approximately 6% and also suggested IL6 and TGFB1 (transforming growth factor-beta 1 or TGF-β1) are the two pro-inflammatory cytokines involved in the pathogenesis of Osteoarthritis, may be associated with DDH in the caucasian population [30, 31]. Nandhagopal *et al.,* found any physical limitation (LGA, oligohydramnios, twins) in utero can contribute to DDH. It also increases the risk of other abnormalities like Metatarsus adducts congenital muscular torticollis, and congenital knee dislocation. Orak *et al.,* found postmaturity is a risk factor [22, 32].

In this study we found the highest prevalence of dysplasia was present in unilateral condition. Majority of neonates (70.37%) had dysplasia on left side and 7.41% had dysplasia on right side respectively. The prevalence of bilateral condition was 12(22.22%) among 54 neonates [Table 3]. Anastácio *et al.,* analyzed 21 patients with bilateral DDH (42 hips operated) [28].

Management of DDH:

The goal is to provide an optimal environment for the growth of the femoral head and acetabulum. So a high index of suspicion and routine surveillance is needed to detect DDH and prevent complications.

To provide this optimal contact between the femoral head and acetabulum, various treatment modalities like abduction splinting, closed reduction, open reduction are available [22].

Double diapering is most likely harmless.

0 to 4 Weeks

1. Mild instability without a dislocatable hip can be watched [33].
2. Early referral to an orthopedic surgeon experienced treatment of DDH will be optimal if the hips are dislocatable. The application of abduction splints (Pavlik harness) will be up to the orthopedic surgeon who manages it. But a study done by Larson JE *et al.,* concluded waiting up to 30 days before initiation of treatment shows no significant difference in the outcome [34].

1 to 3 Months

Abduction devices like Pavlik harness is the widely used device for DDH. It consists of an anterior strap that flexes the hip at 90 degrees and prevents extension, posterior strap to prevent adduction. Its worn 23 hours per day for at least six weeks or until the hip is stable. The USG of the hip is done every 3- 4 weeks to monitor the position of the femoral head. The success rate is about 90 % for Barlow's positive hip.

The failure rate is high with the following conditions: Ortolani positive hip, initiation of treatment after seven weeks, foot deformity.

If the hips are not reduced by three weeks, semi-rigid, non-flexible abduction devices like Ilfed orthosis to keep the hip in abducted position can be tried in a study by Sankar *et al.,* 82 % success rate with Ilfed orthosis after Pavlik harness failure [22, 35, 36].

CONCLUSION AND RECOMMENDATIONS

In our study, we found that if DDH detected early it will be a common illness that can be successfully treated non-operatively. For older individuals with dislocated or unstable hips, surgery is necessary. Surgery's function in treating acetabular dysplasia in children is changing and largely determined by symptoms. Expanding therapy choices for DDH and improved anatomical patient assessment skills among doctors will result in the proper intervention at the right time.

REFERENCES

1. Agostiniani, R., Atti, G., Bonforte, S., Casini, C., Cirillo, M., De Pellegrin, M., ... & Vezzali, N. (2020). Recommendations for early diagnosis of Developmental Dysplasia of the Hip (DDH): working group intersociety consensus document. *Italian Journal of Pediatrics*, 46(1), 1-7.

2. Shipman, S. A., Helfand, M., Moyer, V. A., & Yawn, B. P. (2006). Screening for developmental dysplasia of the hip: A systematic literature review for the U.S. Preventive Services Task Force. *Pediatrics*, 117, e557-e576.
3. Moraleda, L., Albiñana, J., Salcedo, M., & Gonzalez-Moran, G. (2013). Dysplasia in the development of the hip. *Rev Esp Cir Ortop Traumatol*, 57(1), 67–77.
4. Dezateux, C., & Rosendahl, K. (2007). Developmental dysplasia of the hip. *Lancet*, 369(9572), 1541–1552.
5. Dunn, P. M. (1976). The anatomy and pathology of congenital dislocation of the hip. *Clin Orthop Relat Res*, 119, 23–27.
6. Schwend, R. M., Shaw, B. A., & Segal, L. S. (2014). Evaluation and treatment of developmental hip dysplasia in the newborn and infant. *Pediatric Clinics*, *61*(6), 1095-1107.
7. Ponseti, I. V. (1978). Morphology of the acetabulum in congenital dislocation of the hip. Gross, histological and roentgenographic studies. *JBJS*, *60*(5), 586-599.
8. Kotlarsky, P., Haber, R., Bialik, V., & Eidelman, M. (2015). Developmental dysplasia of the hip: What has changed in the last 20 years?. *World journal of orthopedics*, *6*(11), 886-901.
9. Kokavec, M., & Bialik, V. (2007). Developmental dysplasia of the hip. Prevention and real incidence. *Bratislavske lekarske listy*, *108*(6), 251-254.
10. Loder, R. T., & Skopelja, E. N. (2011). The epidemiology and demographics of hip dysplasia. *International Scholarly Research Notices*, *2011*, 238607.
11. Shaw, B. A., Segal, L. S., Otsuka, N. Y., Schwend, R. M., Ganley, T. J., Herman, M. J., ... & Smith, B. G. (2016). Evaluation and referral for developmental dysplasia of the hip in infants. *Pediatrics*, *138*(6).
12. Bowen, J. R., & Kotzias-Neto, A. (2006). Developmental dysplasia of the hip. *Brooklandville: Data Trace Publishing Company.*
13. Wynne-Davies, R. (1970). Acetabular dysplasia and familial joint laxity: two etiological factors in congenital dislocation of the hip: a review of 589 patients and their families. *The Journal of Bone and Joint Surgery. British Volume*, *52*(4), 704-716.
14. Dunn, P. M. (1976). The anatomy and pathology of congenital dislocation of the hip. *Clinical Orthopaedics and Related Research (1976-2007)*, *119*, 23-27.
15. Wilkinson, J. A. (1972). A post-natal survey for congenital displacement of the hip. *The Journal of Bone and Joint Surgery. British volume*, *54*(1), 40-49.
16. Lloyd-Roberts, G. C. (1955). Osteoarthritis of the hip: a study of the clinical pathology. *The Journal of Bone and Joint Surgery. British volume*, *37*(1), 8-47.
17. Gade, H. G. (1947). A contribution to the surgical treatment of osteoarthritis of the hip-joint. *Oslo: Grøndahl & Søns.*
18. Samora, J., Quinn, R. H., Murray, J., Pezold, R., & Hall, Q. (2019). Management of developmental dysplasia of the hip in infants up to six months of age: intended for use by orthopaedic specialists. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, *27*(8), e360-e363.
19. Bond, C. D., Hennrikus, W. L., & DellaMaggiore, E. D. (1997). Prospective evaluation of newborn soft-tissue hip "clicks" with ultrasound. *Journal of Pediatric Orthopaedics*, *17*(2), 199-201.
20. Jones, D. A. (1991). Neonatal hip stability and the Barlow test. A study in stillborn babies. *The Journal of Bone and Joint Surgery. British volume*, *73*(2), 216-218.
21. Patel, H., & Canadian Task Force on Preventive Health Care. (2001). Preventive health care, 2001 update: screening and management of developmental dysplasia of the hip in newborns. *Cmaj*, *164*(12), 1669-1677.
22. Nandhagopal, T., & De Cicco, F. L. (2022). Developmental Dysplasia of the Hip. [Updated 2022 Oct 3]. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing.
23. Hauk, L. (2017). Developmental Dysplasia of the Hip in Infants: A Clinical Report from the AAP on Evaluation and Referral. *Am Fam Physician*, 96(3), 196-197.
24. American Institute of Ultrasound in Medicine; American College of Radiology. (2009). AIUM practice guideline for the performance of an ultrasound examination for detection and assessment of developmental dysplasia of the hip. *J Ultrasound Med*., 28(1), 114-9.
25. Tönnis, D. (1984). General radiography of the hip joint. In: Congenital dysplasia and dislocation of the hip: Springer-Verlag.
26. Ruiz Santiago, F., Santiago Chinchilla, A., Ansari, A., Guzmán Álvarez, L., Castellano García, M. D. M., Martínez Martínez, A., & Tercedor Sánchez, J. (2016). "Imaging of Hip Pain: From Radiography to Cross-Sectional Imaging Techniques". *Radiology research and practice*, 2016, 1-5.
27. Geertsema, D., Meinardi, J. E., Kempink, D. R., Fiocco, M., & van de Sande, M. A. (2019). Screening program for neonates at risk for developmental dysplasia of the hip: comparing first radiographic evaluation at five months with the standard twelve week ultrasound. A prospective cross-sectional cohort study. *International Orthopaedics*, *43*(8), 1933-1938. doi: 10.1007/s00264-018-4089-2. Epub 2018 Aug 18. PMID: 30121837; PMCID: PMC6647175.
28. Kotzias Neto, A., Ferraz, A., Foresti, F. B., & Hoffmann, R. B. (2014). Bilateral developmental dysplasia of the hip treated with open reduction and

Salter osteotomy: analysis on the radiographic results. *Revista Brasileira de Ortopedia*, *49*, 350-358. doi: 10.1016/j.rboe.2014.03.023. PMID: 26229826; PMCID: PMC4511625.

29. Lambeek, A. F., De Hundt, M., Vlemmix, F., Akerboom, B. M. C., Bais, J. M. J., Papatsonis, D. N. M., ... & Kok, M. (2013). Risk of developmental dysplasia of the hip in breech presentation: the effect of successful external cephalic version. *BJOG: An International Journal of Obstetrics & Gynaecology*, *120*(5), 607-612.
30. Kolundžić, R., Trkulja, V., Mikolaučić, M., Kolundžić, M. J., Pavelić, S. K., & Pavelić, K. (2011). Association of interleukin-6 and transforming growth factor-β1 gene polymorphisms with developmental hip dysplasia and severe adult hip osteoarthritis: a preliminary study. *Cytokine*, *54*(2), 125-128.
31. Stevenson, D. A., Mineau, G., Kerber, R. A., Viskochil, D. H., Schaefer, C., & Roach, J. W. (2009). Familial predisposition to developmental dysplasia of the hip. *Journal of Pediatric Orthopaedics*, *29*(5), 463-466.
32. Orak, M. M., Onay, T., Gümüştaş, S. A., Gürsoy, T., & Muratlí, H. H. (2015). Is prematurity a risk factor for developmental dysplasia of the hip? A prospective study. *The bone & joint journal*, *97*(5), 716-720.
33. Lorente Molto, F. J., MASCARELL GREGORI, A., MIRANDA CASAS, L., & MARTI PERALES, V. (2002). Three-year prospective study of developmental dysplasia of the hip at birth: Should all dislocated or dislocatable hips be treated?. *Journal of pediatric orthopedics*, *22*(5), 613-621.
34. Larson, J. E., Patel, A. R., Weatherford, B., & Janicki, J. A. (2019). Timing of Pavlik harness initiation: can we wait?. *Journal of Pediatric Orthopaedics*, *39*(7), 335-338.
35. Vadillo, P., Encinas-Ullan, C. A., Moraleda, L., & Albinana, J. (2015). Results of the Pavlik harness when treating Ortolani-positive hips: predictors of failure and arthrographic findings. *Journal of Children's Orthopaedics*, *9*(4), 249-253.
36. Sankar, W. N., Nduaguba, A., & Flynn, J. M. (2015). Ilfeld abduction orthosis is an effective second-line treatment after failure of Pavlik harness for infants with developmental dysplasia of the hip. *JBJS*, *97*(4), 292-297.

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