Frequency of Risk factors for Developmental Dyslasia of Hip (DDH) in patients presenting to a Tertiary Care Hospital.

Junaid Zeb,[1] Sikandar Hayat,[2] Imran Afzal,[3] Sheikh Naeem U Haq,[4] Muhammad Shoaib,[5] Marwa Zeb,[6] Shehla Khatoon.[7]

[1]Consultant Trauma and Orthopaedics, Russell Hall Hospital, The Dudley Group NHS Foundation Trust UK.
[2]Associate Professor Department of Orthopaedics Khyber Teaching Hospital, Peshawar.
[3]Orthopaedics and Spine Unit, Hayatabad Medical Complex, Peshawar.
[4]Assistant Professor Dow University of Health Sciences Karachi
[5]Orthopaedics and Spine Unit, Hayatabad Medical Complex, Peshawar.
[6]Bannu Medical College Bannu
[7]Khyber Medical College, Peshawar

Authorship and contribution Declaration:
Each author of this article fulfilled ALL 04 Criteria of Authorship:
1.Conception and design of or acquisition of data or analysis and interpretation of data.
2.Drafting the manuscript or revising it critically for important intellectual content.
3.Final approval of the version for publication.
4.All authors agree to be responsible for all aspects of their research work.

Corresponding author:
Sikandar Hayat
E-mail: drsikandar68@gmail.com

ABSTRACT

Objective: To determine the frequency of risk factors for developmental dysplasia of hip (DDH) in patients presenting to a tertiary care hospital.
Methods: This cross-sectional study was conducted in Department of Orthopedics and Trauma of Khyber Teaching Hospital (KTH), Peshawar from 26th October 2020 to 26th April 2021. Parents of all children with DDH fulfilling the inclusion criteria were interviewed for identifying risk factors for DDH. Data stratification was done for comparison of important variables. Statistical significance was determined by calculating P value with Chi square test and Fischer exact test. P values < 0.05 was considered significant.
Results: In this study 163 children with DDH were included. The mean age was 7.56±3.357 years**.** Males were 91(55.8%) and female were 72(44.2%). History of oligohydramnios was noted in 43 (26.385) children and breach presentation in 34(20.9%). Pre term children were 23 (14.11) and post term 22 (13.50). Family history was positive in 17 (10.43) children. The frequency of DDH was more in female children with full term and in male children with post term and positive family history (P<0.05)
Conclusion: Oligohydramnios, breach presentation and preterm delivery were the most frequently noted risk factors present in more than half of our patients of DDH in our series.
Keywords: Breech, Developmental dysplasia of hip joint, Oligohydramnios, Risk factors.

This article may be cited as: Zeb J, Hayat S, Afzal I, Haq SN, Shoaib M, Zeb M, et al. Frequency of Risk factors for Developmental Dyslasia of Hip (DDH) in patients presenting to a Tertiary Care Hospital.J Pak Orthop Assoc.2022;34(4):163-165

INTRODUCTION

Developmental dysplasia of the hip (DDH) is a spectrum of anatomic hip anomalies that varies from mild acetabular dysplasia to the more serious subluxation or dislocation of the femoral head.[1,2] The prevalence of DDH varies significantly around the globe and ranges from 0.5% to 1.5%. The underlying reasons are multifaceted and both mechanical and genetic elements have been identified. The greater occurrence in female children and those with a positive family history indicates genetic causation.[3] The higher risk for children delivered with breech presentation, older maternal age, post maturity, oligohydramnios, or any other crowded intrauterine circumstances reflects the mechanical causation.[4-5] Literature reported that first born babies, female gender, positive family history, breech presentation, oligohydramnios and caesarian deliveries are the possible risk factors for DDH with variable frequency.[6-12]

The objective of our study was to determine the frequency of risk factors of developmental dysplasia of hip (DDH) in patients presenting to OPD of our hospital.

METHODS

We conducted this cross-sectional study in Department of Orthopedics and Trauma of Khyber Teaching Hospital (KTH) Peshawar from 26th

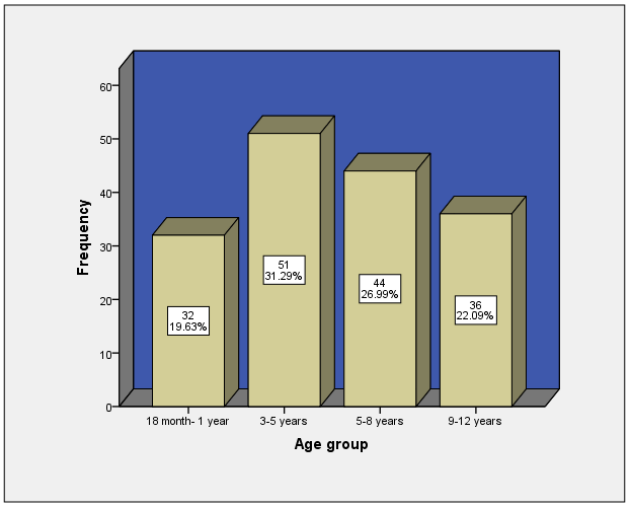
October 2020 to 26th April 2021. Parents of all children with DDH fulfilling the inclusion criteria were interviewed for identifying risk factors for DDH. All children with 18 months to 12 years of age with DDH presenting to Orthopaedic OPD of our hospital were included. Patients with associated neuromuscular or other syndromic disorders, teratologic hip and those whose mothers had insufficient recall and record of her past obstetric history were excluded. The study was approved by the Ethical Committee of our hospital. Informed written consent was obtained from all parents of DDH children. Complete history was taken from mother. All the children were thoroughly examined. Radiographs of the hip was obtained to confirmed the diagnosis of DDH. Data was collected through face to face interview with the mother of children. An inquiry was made regarding family history and full pre-natal, natal and post-natal history. Relevant supporting documents were examined.

Data was analyzed using SPSS 22. For continuous variables like age mean and standard deviation was calculated. Frequency and percentages were calculated for categorical variables like gender of the child. P value was calculated with Chi-square test and Fisher exact test for statistical significance of important variables. P value <0.05 was considered significant. Data was presented in table and graph where necessary.

RESULTS

We included 163 children of DDH in this study. The mean age of our sample was 7.56±3.357 years**.** Majority(31.2%,n=51) of our children were in the age range of 3 to 5 years as shown in graph 1. Males were 91(55.8%) and female were 72(44.2%). Mode of delivery among 163 patients revealed Caesarian section in 122(74.8%) and normal vaginal delivery in 41(25.2%). Parity was 1 to 2 children in 76(46.6%), 3 to 4 children in 55(33.7%) and more than 4 children in 32(19.6%). Distribution of risk factors of developmental dysplasia of hip joint among 163 patients showed that history of breach presentation was present in 34(20.9%) children, oligohydramnios in 43 (26.385), preterm birth in 22 (13.50%) term birth in 23(14.1%), post term birth in 24(14.72%) and positive family history in 17 (10.43%) children.

Graph 1: Age distribution of children in our study.



The frequency of DDH was more in female children with full term and in male children with post term and positive family history (P<0.05) as shown in table I.

Table II: Frequency of risk factors for DDH stratified by genders.

S. N	Risk factors for DDH	Male		Female		*P* Value
		Number	Percentage	Number	Percentage	
1	History of Breach presentation	15	16.3	19	26.8	0.084
2	History of oligohydramnios	23	25.0	20	28.2	0.649
3	Preterm Birth	16	17.4	7	9.9	0.171
4	Full Term Birth	1	1.1	23	32.4	<0.001
5	Post Term Birth	22	23.9	0	0.0	<0.001**
6	Positive Family history	15	16.3	2	2.8	0.005 **

*Chi-square test, ** Fisher exact test

DISCUSSION

Developmental Dysplasia of Hip (DDH) consist of a diverse spectrum of anomalies ranging from instability to frank dislocation including dysplasia of proximal femur and acetabulum as well.[13] All newly born in Sweden are routinely screened for DDH by a trained physician and children with abnormal findings with risk factors treated like breech presentation, female sex, oligohydramnios, first baby and positive family history for DDH are refereed to Paediatric

Orthopaedic surgeon.[13-15] It has been reported that 1 to 2 per 1000 cases of DDH were diagnosed before use of ultra sound screening in UK and incidence has increased upto 5 to 30 cases per 1000 after selective US screening of high risk babies. This increase in incidence reflects the diagnosis of more dysplastic hips (reduced but unstable) by ultrasound.[14] Babies with positive family history of DDH and breech presentation are now routinely screened by ultrasonography although female sex, primiparity and oligo hydramnios are considered equally important.[15] Breech presentation, female gender, positive family history and first born baby are well known risk factors for DDH in the literature. [5-7,16-20] Our results are consistent with previously reported risk factors for DDH in the literature. We had noted that the frequency of DDH was more in female children with full term and in male children with post term and positive family history ($P<0.05$)

Our study had few limitations. Our sample size was small. We could not calculate odds ratio in our study. We recommend further studies to verify our results.

CONCLUSION

Oligohydramnios, breach presentation and preterm delivery were the most frequently noted risk factors present in more than half of our patients of DDH in our series. Mandatory screening program for DDH in all high risk new born is therefore recommended.

Conflict of Interest: None

Grants/Funding: None

REFERENCES

1. de Hundt M, Vlemmix F, Bais JM, Hutton EK, de Groot CJ, Mol BW, Kok M. Risk factors for developmental dysplasia of the hip: a meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2012;165(1):8-17.
2. Forlin E, Munhoz da Cunha LA, Figueiredo DC. Treatment of developmental dysplasia of the hip after walking age with open reduction, femoral shortening, and acetabular osteotomy. Orthop Clin North Am. 2006 ;37(2):149-160.
3. Colta RC, Stoicanescu C, Nicolae M, Oros S, Burnei G. Hip dysplasia screening - epidemiological data from Valcea County. J Med Life. 2016;9(1):106-111.
4. Loder RT, Skopelja EN. The epidemiology and demographics of hip dysplasia. ISRN Orthop. 2011;2011:238607. doi: 10.5402/2011/238607.
5. Çekiç B, Erdem-Toslak İ, Sertkaya Ö, Filiz S, Kılar Y, Köroğlu M, Köse Ö. Incidence and follow-up outcomes of developmental hip dysplasia of newborns in the Western Mediterranean Region. Turk J Pediatr. 2015 ;57(4):353-458.
6. Kolb A, Chiari C, Schreiner M, Heisinger S, Willegger M, Rettl G, Windhager R. Development of an electronic navigation system for elimination of examiner-dependent factors in the ultrasound screening for developmental dysplasia of the hip in newborns. Sci Rep. 2020 ;10(1):16407. doi: 10.1038/s41598-020-73536-9.
7. 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.
8. Lehmann HP, Hinton R, Morello P, Santoli J. Developmental dysplasia of the hip practice guideline: technical report. Committee on Quality Improvement, and Subcommittee on Developmental Dysplasia of the Hip. Pediatrics. 2000 ;105(4):E57. doi: 10.1542/peds.105.4.e57.
9. Lambeek AF, De Hundt M, Vlemmix F, Akerboom BM, Bais JM, Papatsonis DN, Mol BW, Kok M. Risk of developmental dysplasia of the hip in breech presentation: the effect of successful external cephalic version. BJOG. 2013 ;120(5):607-12. doi: 10.1111/1471-0528.12013.
10. Janssen D, Kalchschmidt K, Katthagen BD. Triple pelvic osteotomy as treatment for osteoarthritis secondary to developmental dysplasia of the hip. Int Orthop. 2009 Dec;33(6):1555-1559.
11. El-Sayed M, Ahmed T, Fathy S, Zyton H. The effect of Dega acetabuloplasty and Salter innominate osteotomy on acetabular remodeling monitored by the acetabular index in walking DDH patients between 2 and 6 years of age: short- to middle-term follow-up. J Child Orthop. 2012;6(6):471-477.
12. McKibbin B. Anatomical factors in the stability of the hip joint in the newborn. J Bone Joint Surg Br. 1970 ;52(1):148-159.
13. Ralis Z, McKibbin B. Changes in shape of the human hip joint during its development and their relation to its stability. J Bone Joint Surg Br. 1973;55(4):780-785.
14. Ziegler J, Thielemann F, Mayer-Athenstaedt C, Günther KP. Natürlicher Verlauf von Hüftreifungsstörungen und Hüftdysplasie. Eine Metaanalyse publizierter Literatur [The natural history of developmental dysplasia of the hip. A meta-analysis of the published literature]. Orthopade. 2008;37(6):515-6, 518-24. German. doi: 10.1007/s00132-008-1238-0.
15. Getz B The hip joint in Lapps and its bearing on the problem of congenital dislocation. Acta Orthop Scand Suppl. 1955;18:1-81.
16. Hoaglund FT, Yau AC, Wong WL. Osteoarthritis of the hip and other joints in southern Chinese in Hong Kong. J Bone Joint Surg Am. 1973;55(3):545-557.
17. Sankar WN, Weiss J, Skaggs DL. Orthopaedic conditions in the newborn. J Am Acad Orthop Surg. 2009 Feb;17(2):112-22.
18. Salman M, Hayat S, Saqib M, Gulzada. Short term results of Antero lateral approach for open reduction of neglected Developmental dysplasia of Hip (DDH). J Pak Orthop Assoc.2019; 31(10:15-19.
19. Karmazyn BK, Gunderman RB, Coley BD, Blatt ER, Bulas D, Fordham L, et al. American College of Radiology. ACR Appropriateness Criteria on developmental dysplasia of the hip--child. J Am Coll Radiol. 2009 Aug;6(8):551-557.
20. AIUM-ACR-SPR-SRU Practice Parameter for the Performance of an Ultrasound Examination for Detection and Assessment of Developmental Dysplasia of the Hip. J Ultrasound Med. 2018;37(11):E1-E5. doi: 10.1002/jum.14829.