Original Article

IDIOPATHIC DEVELOPMENTAL DYSPLASIA OF HIP – A DEMOGRAPHICAL STUDY

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Abstract

Objective: The objective of this study was to record the demography of idiopathic developmental dysplasia of hip and compare it with other similar studies reported in Pediatric Orthopaedic literature.

Methodology: Thirty patients attending outdoor, department of Pediatric Orthopedic Surgery, Children's Hospital and Institute of Child Health, Lahore, with idiopathic developmental dysplasia of hip were studied. Detailed histories of the patients were taken, thorough clinical examinations were done, ultrasonography and radiological examinations of the hip were performed.All the patients were followed up till the treatment and demography of idiopathic developmental dysplasia of hip was recorded.

Results: In this demographical study of idiopathic developmental dysplasia of hip, age of presentation ranged from6months to 60 months withmedian age of 27 months. There were 24 (80%) females and 6 (20%) males with female to male ratio of4:1. Twelve (40%) were first born babies. Family history was positive in 18 (60%) patients. Left hip was affected in 10 (33.3%) patients and right hip was affected in 8 (26.6%) patients. Twelve (40%) patients had bilateral involvement of hip joints. All the forty two affected hips of thirty patients had limited abduction. Barlow jerk of entry and Ortolani provocative test were negative. Ultrasonographic and radiological signs of idiopathic developmental dysplasia of hip were positive in all the patients. Among these thirty patients, 5 (16.67%) patients treated with unilateral and 1 (3.33%) patient treated with bilateral adductor tenotomy, closed reduction and hip spica application. Nine (30%) patients treated with unilateral and 3 (10%) patients treated with bilateral adductor tenotomy, open reduction and hip spica application. Four (13.33%) patients treated with bilateral adductor tenotomy, open reduction and hip spica application. Four (13.33%) patients treated with unilateral and 4 (13.33%) patients treated with bilateral complex

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surgical procedure of adductor tenotomy, illiopsoas release, open reduction, femoral derotation osteotomy, femoral shortening and capsulorraphy of the hip joint.
Conclusion: In this demographical study of idiopathic developmental dysplasia of hip, it was observed that the age of presentation and positive family history were alarmingly high as compared to other reference studies. Therefore, it is concluded that public awareness campaigns, national screening programs and genetic counseling should be introduced for better management of idiopathic developmental dysplasia of hip.
Keywords: Idiopathic Developmental dysplasia of Hip – Demography.

Introduction

Idiopathic developmental dysplasia of hip is a common disorder in pediatric population with an overall incidence of approximately 3 to 4 per 1000 live births.[1] In this condition, femoral head has an abnormal relationship to the acetabulum which includes frank dislocation (luxation), partial dislocation (subluxation) or instability wherein the femoral head comes in and out of the socket.[2] Idiopathic developmental dysplasia of hipdiagnosed in infancy is considered multifactorial in origin with both intrauterine environmental and hereditary contributing factors.[3] Demography of idiopathic developmental dysplasia of hip varies with ethnicity and geographical distribution of the population.[4] Therefore, this study was conducted to record the demography of idiopathic developmental dysplasia of hip in our population for comparison with other reference studies.

Inclusion Criteria

Children with idiopathic developmental dysplasia of the hip attending outdoor department, Children's Hospital and Institute of Child Health, Lahore.

Exclusion Criteria

Patients with neuromuscular disorders, myelodisplasia, and arthrogryposis multiplex congenital were excluded from the study.

Material and Methods

Methodology

Thirty patients attending outdoor, department of Pediatric Orthopedic Surgery, Children's Hospital and Institute of Child Health, Lahore, with idiopathic developmental dysplasia of hip were studied. Detailed histories of the patients were taken, thorough clinical examinations were done, ultrasonography and radiological examinations of the hip were performed. All the patients were followed-up till the treatment and demography of idiopathic developmental dysplasia of hip was recorded.

Results

In this demographical study of idiopathic developmental dysplasia of hip, age of presentation ranged from 6months to 60 months with median age of 27 months. There were 24 (80%) females and 6 (20%) males with female to male ratio of 4:1. Twelve (40%) were first born babies. Family history was positive in 18 (60%) patients. Left hip was affected in 10 (33.3%) patients and right hip was affected in 8 (26.6%) patients. Twelve (40%) patients had bilateral involvement of hip joints. All the forty two affected hips of thirty patients had limited abduction. Barlow jerk of entry and Ortolani provocative test were negative. Ultrasonographic and radiological signs of idiopathic developmental dysplasia of hip were positive in all the patients. Among these thirty patients, 5 (16.67%) patients treated with unilateral and 1 (3.33%) patient treated with bilateral adductor tenotomy, closed reduction and hip spica application. Nine (30%) patients treated with unilateral and 3 (10%) patients treated with bilateral adductor tenotomy, open reduction and hip spica application. Four (13.33%) patients treated with bilateral adductor tenotomy, open reduction and hip spica application. Four (13.33%) patients treated with unilateral and 4 (13.33%) patients treated with bilateral complex surgical procedure of adductor tenotomy, illiopsoas release, open reduction, femoral derotation osteotomy, femoral shortening and capsulorraphy of the hip joint.

Discussion

In our study age of presentation for treatment of idiopathic developmental dysplasia of hip ranged from 6 months to 60 months with median of 27 months. Age at the time of presentationfor treatment is an important factor because physical findings[5-13] and treatment method changes with increasing delay in diagnosis. Treatment of idiopathic developmental dysplasia of

hip ranges from regular clinical examinations to complex surgical procedures. Joel A Lerman et al 2001,[14] reported a study of 93 patients with idiopathic developmental dysplasia of hip. In this studytheage range at diagnosis was 1 – 126 days with median age of 7 days. Randall T Loder and Condyshafer 2015,[15] reported a similar study of 424 children with the median age 1.6 months, as the age of presentation. Age of presentation in our study as compare to above mentioned studies is significantly high. The patients presented for treatment when their parents felt continuous difficulty in changing diaper or observed limping / waddling gait of the child. It is due to lack of knowledge or ignorance of the parents of the patient.

In our study 24 (80%) patients were females and 6 (20%) were males with a female to male ratio of 4:1. In previously reported similar studies females are more affected by idiopathic developmental dysplasia of hip. As Joel A Lerman et al 2001[14] reported a study of93 patients with idiopathic developmental dysplasia of hip with 74 (80%) females and 19 (20%) males with a female to male ratio of 4:1. David A. Stevenson MD et al 2009,[16] reported a study of 1649 patients among them 1164 (71%) were female and 485 (29%) were male with a female to male ratio of 2.4:1. Wudbhav N. Sankar et al, 2011[17] reported a study of 421 patients of idiopathic developmental dysplasia of hip with 356 (84.5%) female and 65 male (15.5%) with a female to male ratio of 5.4:1. Vito Pavone[18] et al, 2015 reporteda study of 351 patients with idiopathic developmental dysplasia of hip with 248 (70.65%) females and 103 (29.35%) males with a female to male ratio of 2.4:1. Randall T Loder and Condyshafer 2015[15] reported a study of 424 children with idiopathic developmental dysplasia of hip with 363 (85.6%) females and 61 males (14.4%) with a female to male ratio of 6:1. In our study female to male ratio of idiopathic developmental dysplasia of hip is comparable with other reported studies as majority of the patients were female.

In our study, 12 (40 %) patients were first born babies. There is increased incidence of developmental dysplasia of hip in first bornbabies.[5,11,19-21] Which is attributed to "crowding phenomena". David A. Stevenson, MD et al 2009,[16] reported a study of 1649 patients with idiopathic developmental dysplasia of hip with 681 (41.5%) first born babies. Randall T Loder and Condyshafer 2015,[15] in a study of 424 children with idiopathic developmental dysplasia of hip with 205 (48.3%) first – born babies. In our study this finding is also comparable with other reported studies in the literature.

In our study, 8 (27%) patients were born with breech presentation. Breech presentation is a major risk factor for idiopathic developmental dysplasia of hip because during passage of the baby through birth canal hip joint is forced posterosuperiorly, this may result in idiopathic developmental dysplasia of hip. David A. Stevenson, MD et al, 2009[16] reported a study of 1640 patients among them 355 (21.6%) infants born with breech presentation. Eric J. Sarkissian 2015[24] in a study of 115 idiopathic developmental dysplasia of hip reported 68 (59%) infants born with breech presentation. Vito Pavoni et al, 2015[18] reported a study of 351 patients with idiopathic developmental dysplasia of hip in which 35 (10.09%) infants born with breech presentation. Randall T Loder and Condyshafer 2015[15] reported a study of 424 patients of idiopathic developmental dysplasia of hip in which 137 (32.4%) infants born with breech presentation. In infants of idiopathic developmental dysplasia of hip, breech presentation ranges from 10.09% to 59% which show wide variation in different geographical distributions.

In our study, family history was positive in 18 (60%) patients. Infants with positive family history have higher risk of idiopathic developmental dysplasia of hip. As Eric J. Sarkissian 2015[24] in a study of 115 patients of idiopathic developmental dysplasia of hip reported positive family history in 14 (12%) infants. Vito Pavoni et al 2015,[18] in a study of 351 patients with idiopathic developmental dysplasia of hip reported positive family history in 25 (7.12%) infants. Randall T Loder and Condyshafer 2015[15] a study of 424 patients with idiopathic developmental dysplasia of hip reported positive family history in 60 (14.2 %) infants. In our study the percentage of patients with positive family history is significantly high as compared to other studies. It might be due to increased genetic predisposition in our population.

In our study left hip wasaffected in 10 (33.3%) patients. Left hip is more commonly affected by idiopathic developmental dysplasia of hip because during intrauterine life it is forced into adduction against the mother's sacrum in most common foetal positions.[5,25,11] As Wudbhav N. Sankar et al 2011,[17] in a study of 421 patients with idiopathic developmental dysplasia of hip reported involvement of left hip in 326 patients (77%). Vito Pavone et al 2015[18] in a study of 351 patients with idiopathic developmental dysplasia of hip reported involvement of left hip in 114 (45.01%) patients. In our study percentage of left hip involvement is the minimum as compared to the other reference studies.

In our study 12 (40%) patients had bilateral developmental dysplasia of hip. Bilateral involvement might be due to strong genetic predisposition or severe "crowdingphenomena" during intrauterine life. As Joel A Lerman et al 2001[14] Studied 93 patients with idiopathic developmental dysplasia of hip and reported 44 (47.3%) patients had bilateral involvement. Wudbhav N. Sankar et al 2011[17] studied 421 patients with idiopathic developmental dysplasia of hip and reported bilateral involvement in 48 (11.4%) patients. Vito Pavone et al 2015[18] studied 351 idiopathic developmental dysplasia of hip and reported bilateral involvement in 193 (54.99%) patients. Bilateral idiopathic developmental dysplasia of hip ranges from 11.4% to 54.99% which shows it is wide variation in different geographical distributions.

All the forty two affected hip joints of thirty patients had limited abduction. Barlow jerk of entry and Ortolani provocative test were also negative. Diagnosis of idiopathic developmental dysplasia of hip was confirmed by ultrasonography and radiology. Two patients had unilateral and one patient had bilateral adductor tenotomy, closed reduction and hip spica application. Fivepatients had unilateral and eight patients had bilateral adductor tenotomy, open reduction and hip spica application. Fourpatients had bilateral adductor tenotomy, open reduction and hip spica application. Eleven patients hadunilateral and nine had bilateral complex surgical procedure of adductor tenotomy, illiopsoas release, open reduction, femoral derotation osteotomy, femoral shortening, salter innominate osteotomy and capsulorraphy of the hip joint.

Conclusion

In this demographical study of idiopathic developmental dysplasia of hip, it was observed that the age of presentation and positive family history were alarmingly high as compared to other reference studies. Therefore, it is concluded that public awareness campaigns, national screening programs and genetic counseling should be introduced for better management of idiopathic developmental dysplasia of hip.

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