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## Developmental Dysplasia of the Hip in Duhok Governorate

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### Abstract

**Objectives:** This study was conducted to assess the importance and effects of various variables which might have influence in developmental dysplasia of the hip occurrence such as gender, date, place and season of birth, mother's and father's literacy, parent's consanguinity, defect side, number of children in the family, mother's age, family history of developmental dysplasia of the hip and presence of other congenital deformities.

**Methods:** A descriptive cross sectional study design was conducted for 6 months from 1<sup>st</sup>. Oct.2006 to 1<sup>st</sup>.April, 2007. Non-randomized consecutive sample of 1234 were collected from the early detection of childhood disabilities center (E.D.C.D.C.) of Duhok. The population involved was infants of both sexes aged (1day-24 months), i.e. the entire cases that attended the centre during the period from 1/1/2005 to 30/12/2006. Patients' registers or records from (E.D.C.D.C.) were used to collect data about developmental dysplasia of the hip.

**Results:** The results indicated that (43.1%) of developmental dysplasia of the hip cases occur in winter, girls mainly suffer from developmental dysplasia of the hip (66%), bilateral affection was more common (62.1%), the mother's age group of(16-25 years) had the highest occurrence (45.6%), consanguineous parents constitute (54.5%), deliveries conducted in hospitals (89.8%) constituted significantly the highest rate of developmental dysplasia of the hip cases, illiterate mothers (57.8%) were the highest, fathers having primary education were highest and constituted (38.5%), the group with no other disabled children within the same family was the highest (75.4%), the highest rate of developmental dysplasia of the hip cases observed was in families having (1-4) children (77.1%), and finally developmental dysplasia of the hip patients with no other disabilities were the highest (96.6%).

**Conclusion:** The study reveals that the developmental dysplasia of the hip highest during winter, females with DDH were found to be higher than males, patients with bilateral developmental dysplasia of the hip were confirmed to be the highest, mothers aged below 35 years were found to have high rate of child with developmental dysplasia of the hip, consanguineous parents' group was seen to be more related with developmental dysplasia of the hip followed by non consanguine group, developmental dysplasia of the hip cases were found to be more in deliveries conducted at hospitals, non-medical factors such as mother's and father's literacy were noticed to be of importance in DDH occurrence, developmental dysplasia of the hip cases were not associated with other disabled children within the same family, the small size group, had highest frequency of developmental dysplasia of the hip, and patients with no other disabilities were found to be the commonest.

**Key words:** Developmental dysplasia of the hip In Duhok

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### Introduction

**D**evelopmental dysplasia of the hip (DDH) usually occurs in the neonatal period. Dislocations tend to occur after delivery and, thus, they are postnatal in origin, though the exact time when dislocations occur is controversial. Because they are not truly congenital in origin, the term developmental dysplasia of the hip should be used <sup>[1]</sup>. Developmental dysplasia of the hip is a very important condition because success in its treatment depends upon early recognition. Although early detection through a combination of clinical and imaging evaluation is desirable, the diagnosis is overlooked in many children who subsequently come to medical attention for evaluation and treatment at several months to

years of age. A detailed understanding of the pathogenesis of this disorder as well as of the diagnostic imaging workup and the differential considerations is essential to an accurate diagnosis and the institution of appropriate therapy <sup>[2, 3]</sup>. Developmental dysplasia of the hip can predispose a child to premature degenerative changes and painful arthritis. Early detection might help to prevent human tragedies, e.g. among female patients, whose bodies might be deformed and who might be hindered in delivering babies naturally because of undetected developmental dysplasia of the hip <sup>[4]</sup>. In Iraq, unfortunately there are no recorded figures referring to the incidence of developmental dysplasia of the hip. Locally in Iraq, lack of training nursing staffs, pediatricians &

obstetricians is also another problem. Until now there is no proper screening programme, probably due to the unstable conditions of Iraq which make it difficult to establish & maintain an efficient newborn's screening programme [5]. Despite the recent increased awareness of developmental dysplasia of the hip and the importance of thorough screening programs, hip dysplasia continues to be a frequently missed diagnosis in pediatrics [6].

The study aims to describe the epidemiologic features of developmental dysplasia of the hip in Duhok Governorate and to find the risk factors associated with developmental dysplasia of the hip.

### Patients & Methods

To achieve the aims of this study, a cross sectional study design was chosen and performed after the ethical approval had been taken from the authority of the Duhok Directory of Health 'DOH'. The study continued for 6 months from 1<sup>ST</sup>. of Oct.2006 to 1<sup>ST</sup>. of April, 2007.

A sample was collected from Early Detection of Childhood Disabilities Center (E.D.C.D.C.), Duhok, Iraqi Kurdistan, which is situated in Duhok city, rather than from private clinics or from the community, because of easy accessibility, and it ensures a large sample size with a wider geographical distribution as that centre is the only consultant centre in Duhok receiving referred cases from different specialists and from different vicinities.

Duhok city is the centre of Duhok governorate which is one of the three governorates of Iraqi Kurdistan region. The information about the boundaries & population of the city was obtained from the directorate of

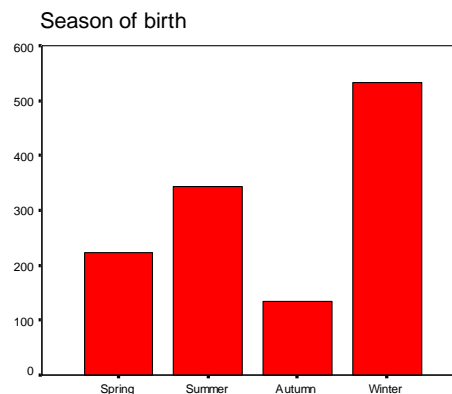
health (DOH) in Duhok governorate in cooperation with the directorate of statistics. This information depends on the last population survey done by the directorate of Duhok statistics in (2005-2006), and according to this survey, the total population of Duhok governorate in (2006) was (909,216).

The target populations involved in this study were infants of both sexes aged (1day-24 months), *i.e.* the entire cases who attended the centre during the period from (1/1/2005 to 30/12/2006) with a final diagnosis of DDH (which done by the senior specialists of the center, through clinical, radiological and ultrasonic examination of the hip joints) and all were from Duhok city and its vicinity.

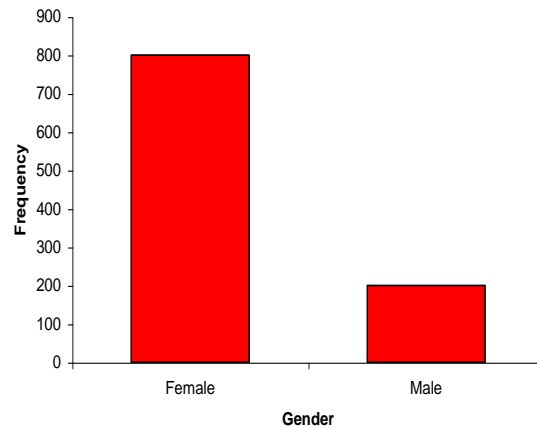
Total number of cases was (1355), but only 1234 DDH cases were chosen, of them (121) cases were excluded due to incomplete data. Patients' registers or records from (E.D.C.D.C.) were used to collect information about the cases of DDH. The main sources of data were directly obtained from that centre which provided all relevant information related to every DDH case. Descriptive statistics was used to clarify the different variables (*i.e.* percentage, frequency, graphic presentation, etc.).

### Results

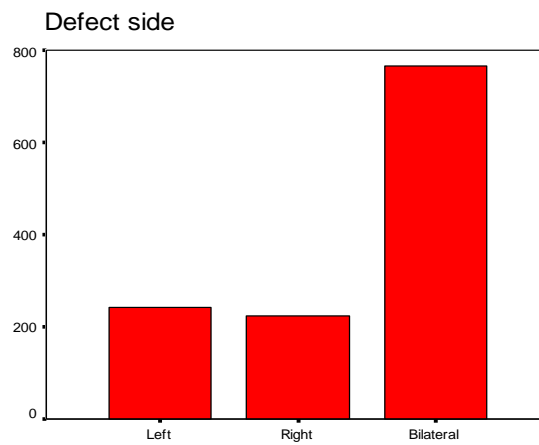
**Fig.1** showed the distribution of DDH cases by season, in winter (532=43.1%), which appears highest, then in summer (344=27.9%), in spring (244=18.2%) and finally in autumn (134=10.9%). **Fig.2**, showed that girls mainly suffer from DDH (815=66%) compared to boys (419=34%). **Fig.3**, showed that bilateral affection was found in 62.1% of cases. **Fig.4** revealed that 45.6% of cases were from the age group of (16-25 years).



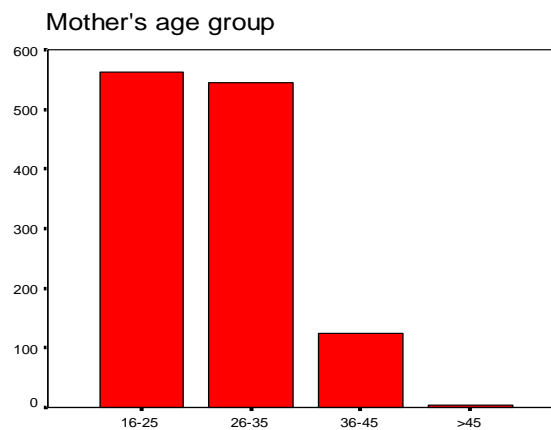
**Fig.1: Distribution of DDH cases by season of birth**



**Fig. 2: Distribution of DDH cases by gender**



**Fig. 3: Distribution of DDH cases by defect side**



**Fig. 4: Distribution of DDH cases by mother's age group**

**Tab.1.** showed that the non-consanguineous parents constitute (561=45.5%), and consanguineous parents constitute (673=54.5%).

**Fig.5.**showed that the deliveries conducted in the hospitals (1108=89.8%) constitutes the

highest rate of DDH. The study shows that 57.8% of mothers were illiterate as in **fig.6.**

**Fig.7** shows distribution of DDH cases according to the level of father's education.

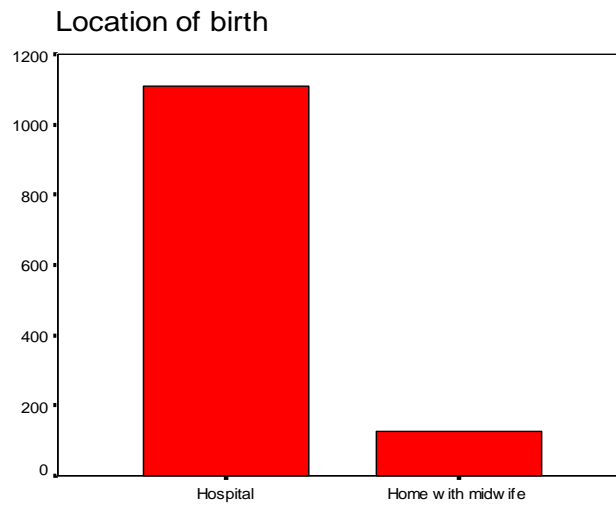
**Tab.2** showed that 75.4% of cases did not have such disability in other children. On the other

hand, in **fig.8** showed that the highest rate observed in families having (1-4) children (951=77.1%). Regarding presence of other

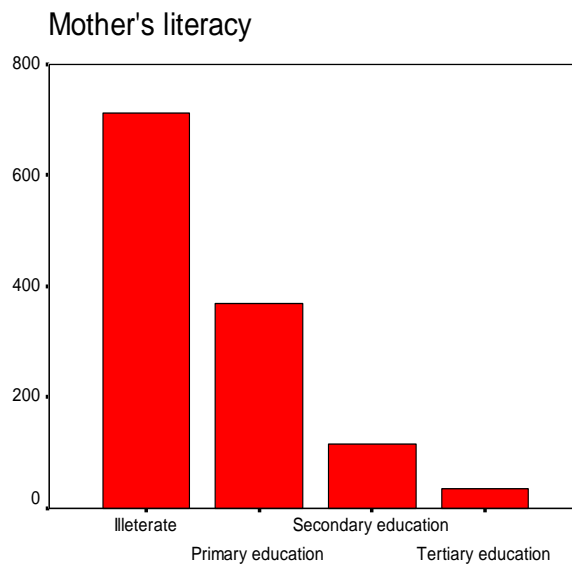
disabilities in the same patient the study reveals absence of such disabilities in 96.6% of cases, as shown in **Tab.3**.

**Table 1: Distribution of DDH cases by Parent's consanguinity**

Parent's Consanguinity	Frequency	Percent
Non consanguineous	561	45.5
Consanguineous	673	54.5
<b>Total</b>	<b>1234</b>	<b>100.0</b>



**Fig. 5: Distribution of DDH cases by place of birth**



**Fig. 6: Distribution of DDH cases according to the level of mother's education**

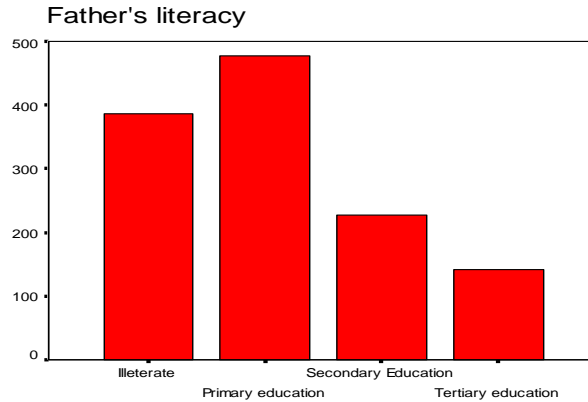


Fig. 7: Distribution of DDH cases according to the level of father's education

Table 2: Distribution of DDH cases by number of other disabled children within same family

No. of other disabled children within same family	Frequency	Percent
Non	930	75.4
1 DDH	202	16.3
2DDH	61	4.9
3 DDH	32	2.6
4 DDH	7	0.6
5 DDH	2	0.2
<b>Total</b>	<b>1234</b>	<b>100.0</b>

Table 3: Distribution of DDH cases by presence of other disabilities

Other disabilities	Frequency	Percent
Non	1192	96.6
Bilateral flat feet	15	1.2
Stiffness of knees	4	0.3
Left calcano-vulgus deformity	1	0.1
Stiffness of knees + bilateral Vascular necrosis	1	0.1
Erb's palsy	6	0.5
Bilateral feet drop	8	0.6
Bilateral calcano-vulgus deformity	5	0.4
Bilateral club feet	2	0.2
<b>Total</b>	<b>1234</b>	<b>100.0</b>

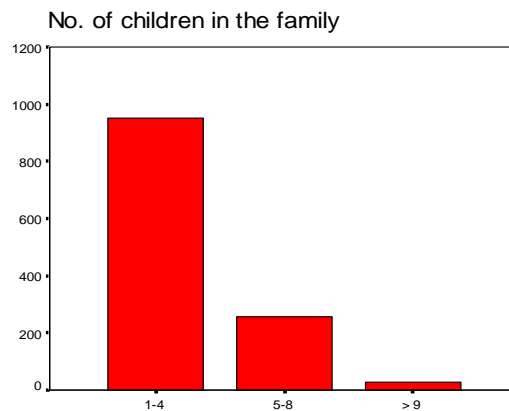


Fig. 8: Distribution of DDH cases by no. of children in the family

## Discussion

Regarding seasonal variation the result is almost close to results obtained by other researchers who mentioned that the peak incidence of DDH was during winter and nearly half of cases were born during winter and spring. These findings might be due to the tight swaddling of the infant with his or her legs in hyperextension<sup>[2, 5, 7]</sup>.

The result concerning the relation of gender with DDH is nearly identical to what most of researchers concluded presuming that girls are much more susceptible to the maternal hormone relaxin, which may also contribute to ligamentous laxity and subsequent hip dysplasia. This is, too, postulated to be related to the effects of additional estrogen produced by the female fetus, which increases ligamentous laxity<sup>[2, 4-17]</sup>. Regarding the side of defect, the current work is compatible with that reported by others<sup>[2, 4, 7, 8, 13]</sup>.

The reason behind higher incidence of left sided DDH is believed to be due to the common intrauterine position of the left hip against the mother's sacrum, forcing it into an adducted position. Possibly, this difference is related to the left occipital anterior position of most neonates, which may limit abduction of the left hip as it lies against the mother's spine, according to the American Academy of Pediatrics<sup>[6]</sup>. The effect of mother's age may be related to the age of marriage of girls in our region, i.e.: earlier age group. The effect of parent's consanguinity which revealed highest rate in consanguineous parents group does not match previous studies (except one study) which concluded that only consanguineous parents are at high risk of DDH<sup>[14,15]</sup>. The effect of place of birth may be related to the lack of experience of medical staff, the haste in decision making to deliver the pregnant women and lack of post-delivery care may play an important role in DDH incidence in the area. The effect of mother's literacy may be related to the early age of marriage among younger women in combination with educational negligence. The effect of presence of other disabilities confirms the importance of the fact mentioned by other researchers that DDH is more common in babies with disorders such as knees & clubfoot deformities<sup>[7, 10- 12, 14- 17, 19]</sup>. In conclusion, DDH cases were highest during winter. Girls with DDH were found to be higher than boys. Patients with bilateral DDH were confirmed to be the highest.

Mothers aged below 25 years were found to be high with DDH. Consanguineous parents' group

was seen to be more related with DDH followed by non consanguine group. DDH patients were found to be more in deliveries conducted at hospitals. Non-medical factors such as mother's and father's literacy were noticed to be of importance in DDH occurrence. Regarding number of children in the family, the small size group, had highest frequency of DDH. Patients with no other disabilities were found to be the commonest. The authors recommend that examination for DDH should be done routinely in newborn infants with positive risk factors particularly girls who must be examined carefully, preferably during the first 24 hours of life, and multiple examinations are recommended since some cases are mild and some develop after birth.

There is important role of family physician in examining for DDH, early diagnosis and referral. This is because treatment earlier in life, especially within the first six months, is safer and more successful than treatment after the child is walking.

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