STATISTICAL STUDY ON CONGENITAL MALFORMATIONS IN TAIZ

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Abstract:

Congenital malformations are structural abnormalities that are present at birth. The present study aims to identify the numbers and the types of congenital malformations in Taiz, in relation to sex, age, sequence and weight of fetus as well as geographical distribution. The sample included 136 cases of congenital malformations from 14908 normal babies during 1.1.2004 to 30.4.2006. The results of this study show that most of congenital malformations were in 2004 (52%), among them 52% were females and 48% were males. Mothers aged 20-34 years give malformed babies(48.5%). (92%) of malformed babies was single while (8%) was twins. (46.3%) of cases was from Taiz City while (29.4%) of them was from rural areas. (52.2%) of cases weighed less than 2500 gram. The most abnormalities that had been got are hydrocephaly, anencephaly, defects of limbs, cleft lips, crania defects, and heart defects.

INTRODUCTION

A congenital malformation (CM) is the term that describes deforms and structural abnormalities of any type that is present at birth. And congenital malformations constitute a public health problem[1]. The congenital malformations make an important contribution to infant mortality. They remain a leading cause of death among infants in many countries in the world[2]. In 1997, congenital malformations accounted for an estimated 495000 deaths worldwide[3]. There were lots of causes for congenital malformations, for example, environmental agents such as agricultural work, the children of mothers who worked in the acute risk period had a greater risk of anencephaly[4], and chromosomal agents. An Italian study[5], found that deaths in downs syndrome babies were mainly due to cardiac and respiratory causes, and in Taiwan chromosomal anomalies rated 94% [6]. The use of valporic acid during the pregnancy period leads to neural tube defects[7]. Severe limb anomalies and other developmental disruptions that were caused by thalidomide during early pregnancy[8]. It is estimated that 7% to 10% of human birth defects results from the disruptive actions of drugs, viruses, and other environmental factors[9]. For 50 to 60% of congenital anomalies, the causes are unknown. Congenital anomalies may be single or multiple and of major or minor clinical significance. Single minor anomalies are present in about 14% of newborns, 90% of infants with three or more minor anomalies also has major defects[10]. The CM rates are different from country to another (Mexico)[4], (Saudi Arabia)[11], (Canada)[12], (France)[13], (Denmark)[14], (USA)[15], (Iran)[16], and (Aden) [17]. This study aims to identify the

numbers and the types of congenital malformations in Taiz and in relation to the sex, age, sequence and weight of fetus as well as geographical distribution.

Materials and Methods

This is a retrospective study which involves all neonatal admitted in different hospitals and clinics (Al-Gomhori Hospital, Al-Hekma Hospital, Al-Hiat Hospital, Al-Kindi Hospital, Al-Refa'ai Hospital, Al-Shifa'a Hospital , Al-Ta'won Hospital, Al-Thaora Hospital, Radha Hospital , Shaher Clinic, Swidi Hospital and Taiz Hospital) using a statistic included visits to these hospitals and clinics. In addition, few information have been collected from some families. Whereas many information could not be collected because of some barriers such as, some hospitals and nurses were irresponsive to provide information. The statistic included the defects during the period from (01.01.2004) to (30.04.2006) in Taiz, using cameras to take photos of those deformed babies . A list of questions was put in one table as shown in (Table 1). We must not forget that the most photos of limbs defects were collected from Taiz Hospital and others from families.

Table (1): An application table for congenital malformations in Taiz

Note	Date of delivery	The cause of this disorder e.g (sign drugs during pregnancy)or	Residence place	Mother 's education	Type of accouchement			Recently disorder				Number of last disorders	Number of abortions	Number of died kids	Number of children	Embryo's Weight	Embryo's age	Mother's age
					Caesarean	Induction	Natural	Type of the disorder	number		Fetus' sex							
									twins	single								

For the detailed data analysis newborns were ultimately considered. The data were therefore analyzed to highlight the pattern and the relative importance of the different types of congenital malformations.

Results and Discussion

A total of 136 newborns with congenital malformations (CM), was registered during the study period. It indicates horrible percentage of malformations especially in 2006 which rated 10% a long 4 months only. In 2004, the highest percentage was recorded (babies 52%), whereas in 2005 it was 38%. The number of malformations during these three years reached 136 cases of 14908 normal babies and this is a high number although many of them couldn't be collected and the most deformation occurrence was in central nervous system (CNS) which included 66 case (48.5%), anencephaly 46 case (33.8%), plate (1,A&B) and hydrocephaly 20 case (14.7%),plate (1,C).The Musculoskeletal came second in frequency, involving 28 case (20.5%) of the newborns, plate (1,D). In the cardiovascular system, this involved 12 case (8.8%), plate (1,E). In the Genitourinary system 10 case (7.4%). The most common anomaly was ambiguous genitalia. The Alimentary tract and Respiratory tract have the similar number, being 8 cases (5.9%). The last ones of CM were in Craniofacial (plate1,F) and Ophthalmic3,1, (2.2% and 0.7%) Tables (2,3).

Table 2. Number of newborns admitted per year and those with CM in the years 2004 to 2006.

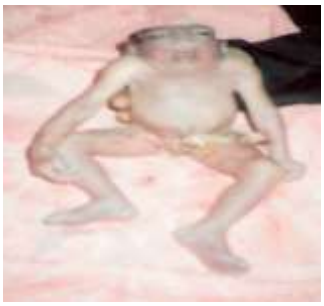
year	Number admitted	Number with CM(%total)
2004	6219	71 (1.14)
2005	7147	51 (0.71)
2006	1542	14 (0.90)
Total	14908	*136 (0.91)*

Table 3. Number of cases and different CM prevalent in 136 newborn.

Location of CM	Number of cases	Percentage of cases
Central Nervous System (Anencephaly, Hydrocephaly)	46 20	33.8 14.7
Musculoskeletal	28	20.5
Cardiovascular	12	8.8
Genitourinary	10	7.4
Alimentary tract	08	5.9
Respiratory tract	08	5.9
Craniofacial	03	2.2
Ophthalmic	01	*0.7*

The CNS malformations were the highest compared with other malformations, because CNS system is first developed in fetus, and this result agrees with another studies by Lee, *et al.* who found that congenital malformations of CNS

was the highest of all other malformations during 1970-1997 in America. Also, Asindi *et al.* (1997) and Alkaaky and Bafadel (2008) found that the CM of CNS represented by 43.1% and alimentary and genitourinary tract represented by 36.9 % tract. In the musculoskeletal system, which involved 28 (20.5%) of cases, alimentary and genitourinary tract is higher than Asindis, *et al.* study 2.5% of cases in Saudi Aribia[11]. In this study, the prevalence rate of cardiovascular malformations was 8.8% of all cases, which is lower than other studies by Khoshnood, *et al.* (2005) in France (47.3%) during 1983 – 2000, in Southern Nevada (USA) during 2003 – 2006 with 36% [15], in Japan 53% during 1990 – 1994[20], and in Saudi Arabia 23.5%[11]. In genitourinary system, which involved 10 (7.4%) of all cases, it is less than the other two studies in Aden (Yemen) 36.9%[17] and Saudi Arabia 9.1%[11]. In the respiratory system, the number of cases is 8 (5.9%), which is lower than other three studies in USA during 1970 – 1997[19] where more than 60% with CNS and cardiovascular malformations, in England[2] 74% during 1980 – 1997 and in Saudi Arabia 4.9% during 1992 – 1995[11]. In this study, the craniofacial malformations were three cases 2.2%, which is less than 2.8%[11] by Ali *et al.*(2008) in Aden (Yemen). The lowest percentage of congenital malformations in this study is in Ophthalmic, one case, and this result is lower than other studies in the world. That may refer to environmental factors, which increase with the passage of time, especially due to radiation & chemical factors, wars and industrial activity. These factors may affect genetic chromosomes for along period of time. When you see malformations in 2004, it has higher percentage than in 2005 because the bad situation of people life leads them to buy cheap drugs without consulting doctors. The CNS, Musculoskeletal, and Cardiovascular systems are the most commonly affected parts in descending order of frequency. This is at par with the experience of Saudi Arabia ([11]; [21]; [22]). Surveys in another Gulf country, like UAE[23] , and in Hungary[24] have revealed a similar picture. In contrast, surveys in USA[25], and in UK[26] identified the CNS as leading among these top three. And this study contradicts with[18] who collected 184 samples during 3 years in cleft lip and palate center Aden, where ophthalmic was due to rubella[9].

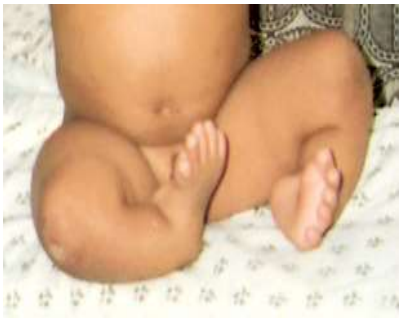


A

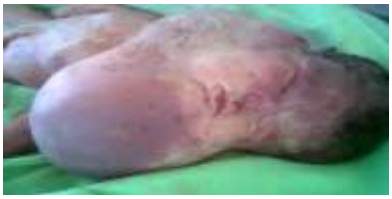
Anencephaly
(Al-Gomhori H. – 2005)

B

C- Hydrocephaly
(ShaherC.2006)



D- Limbs defects (Club foot) Taiz - H.2006



E-Vasculolymphatic enlargement
(Al-Gomhori H. – 2006)

F- cleft lips
(The source: family-2005)

Twins disorder (conjoined twins)
(Al-Hikma H. – 2004)

G **H**

Plate1: Samples of congenital malformations

Malformations and fetus sex

Figure (1) shows the relationship between malformations and fetus sex, including high percentage of 52% in female (71 cases), whereas males have 48% of malformations (65 cases). That may refer to high sensitivity in female, weak body and immunity.

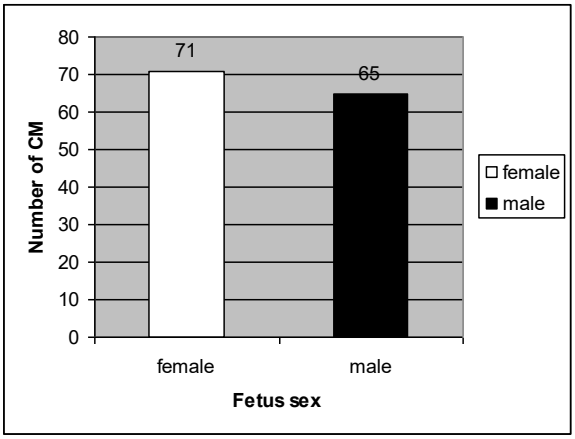


Figure 1: Number of malformations in males & females

Malformations and fetus' sequence

The relationship between the fetus sequence and malformations has taken a place in this research including deformed fetus ranging between 2-5 which rated 52.2%. This may refer to environmental factors or bad social habits such as smoking [30] and chewing Qat. Besides, culture reasons of using unsuitable drugs. Whereas fetus less than 2 represents 32.3% as a result of early marriage and this habit decreases slowly in our society during the last years. Fetus more than 6 represents 15.4%. This may result in decreasing giving birth after poly deliveries or mother diasostic case, and that's all what causes some effects on placenta that causes deformation. In additional generation planning, it is what decreases having more babies (Figure 2).

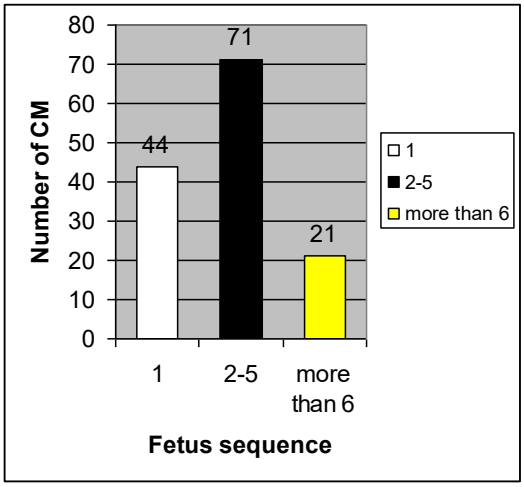


Figure 2: Number of malformations and fetus sequence

Malformation and fetus age

This one shows high percentage of malformations is for fetus which are 7-9 months of age (63.2%) while the low percentage of malformations is for fetus aged 0-3 months (7.3%). This may occur as a result of using drugs(Choramphenicol and Methylergometrine) during the last months of pregnancy or it may relate to the diasostic case of the mother such as high temperature infectious factors, like *Toxoplasma gondii* and rubella virus (Figure 3).

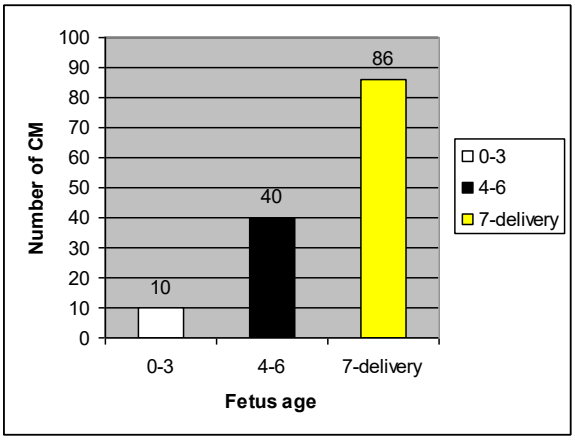


Figure 3: Relationship between no. of malformations and fetus age

Malformations and residence place

A relationship between malformation and residence place has a place in this research and shows a percentage of 46.3% of malformations in the city compared with 29.4% in villages. This is as a result of environmental pollution in cities and industrial activity, whereas in the countryside it refers to nullity of consciousness

diasostic and drugs bad using. This is at par with the experience in Poland (Elizabeth *et al.* 2007). The children of mothers who worked in agriculture in the acute risk period had a greater risk of anencephaly in Mexico[4] (Figure 4)

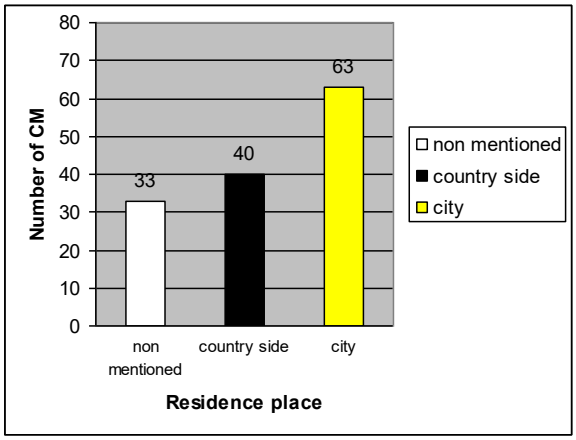


Figure 4: Relationship between no. of malformations and residence place

Malformations and mother's age

Mother's age has also a role in causing malformations. Figure (5) shows that the high percentage reaching (48.5%) of malformations was recorded at mother's age between 20-34 years. This may relate to poly delivery, having drugs as well as high percentage of marriage at this age, if compared with other mothers' ages (Figure 5). This result agrees with[27] the reporter of these cases due to most period of marriage.

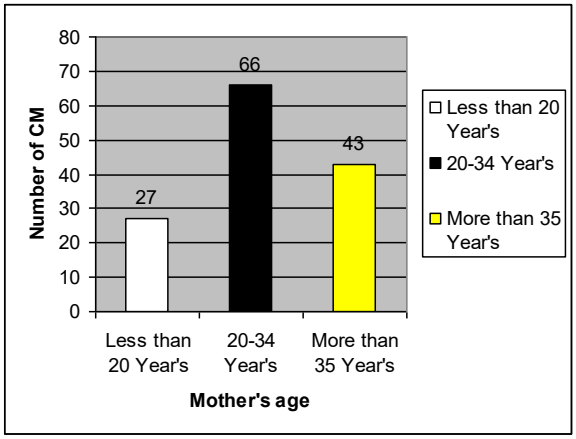


Figure 5: Relationship between no. of malformations and mother's age

Malformations and fetus' weight

The fetus weighing less than 2500gm compared with that fetus weighing more than 2500gm and the data are represented in figure (6). It is noticed that deformed fetus weighing less than 2500gm has a percentage of 52.2% and this value is a little pit higher than that of the fetus weighing more than 2500gm. The fetus weighing less than 2500 gm has usually an organ or a part missing such as left forelimbs digits absence, forelimbs absence, cardio valves and anencephaly. This is due to many factors such as drugs, placenta dysfunction, malnutrition, smoking, chewing Qat, and diasostic cases of mother like a mother with blood pressure, asthma or poly delivery. These results agree with the results of [3] who reported these malformations due to malnutrition and infectious diseases. The low birth weight (< 2500g) is the result of complex and poorly understood interactions between the biological determinants of the mother and fetus[28]. This study agrees with the foundations of [12]who reported about a large decrease in infant deaths due to congenital malformations that was associated with the most recent decline in infant mortality in Canada. Whereas fetus weighing more than 2500gm has often enlargement in organs or parts of body such as hydrocephaly, and this may be as a result of placenta dysfunction or diabetic mothers and other unknown causes.

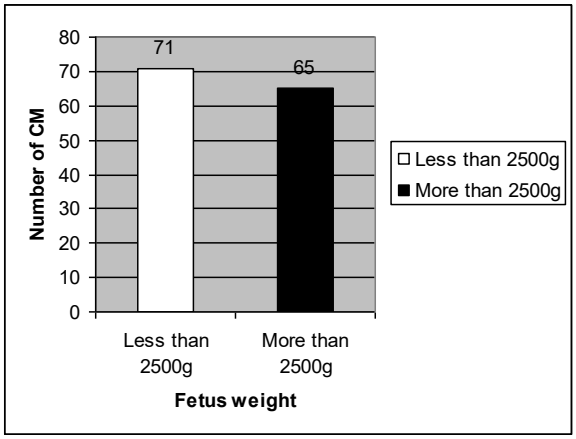


Figure 6: Relationship between no. of malformations and fetus weight

Malformation and number of fetus

Figure (7) shows that the highest percentage is for single fetus, and it is represented by 92% of malformations, whereas only 8% is for twins, plate (1, G&H). This may be due some genetic factors.

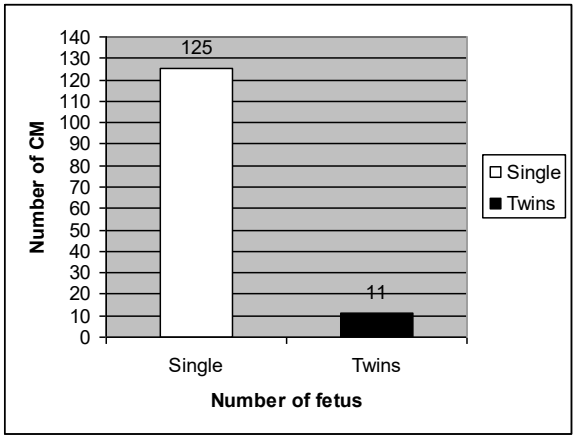


Figure 7: Relationship between no. of malformations and number of fetus

Conclusion

In this study, the central nervous system malformations were mostly of congenital malformations, although it shows decreased number of admitted congenital malformations in comparison with other studies in many countries. We think that the real number of congenital malformations is more than that, because deliveries often occur at homes, and those deliveries taking place in hospitals were not completely counted.

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