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Gender Difference in Specific Congenital Anomalies

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Abstract— **Limited data is available concerning the gender distribution of various congenital anomaly. This study investigated sex differences in the prevalence of congenital anomalies, overall, in a tertiary teaching hospital in Rabat, Morocco.**

Methods: Information on congenital anomalies occurring among pregnancies from January the 1st 2011 to December 31st, 2014 were extracted from the obstetric ward of Maternité Souissi, Rabat, birth register. Anomalies were categorized by groups, subtypes. Frequency in males to that in females were calculated for all of congenital anomaly.

Results:During this 4-year period, there were 68704 birth delivered at Maternite Souissi, the obstetrical department of a Tertiary teaching hospital of Rabat, the capital of Morocco. Out of this birth number, 706 showed congenital malformations. The prevalence rate of congenital malformations was 1.02 %. This study, shows also that males newborns (57.9 %) had more congenital malformations than females (40.5%).

Conclusion:This study adds to the growing evidence of sex-specific differences in the prevalence of a wide range of congenital anomaly.

Index Terms— **Morocco, gender, sexe, congenital malformations.**

I. Introduction

A congenital malformation or birth defect is defined as a structural or chromosomal malformation with a significant impact on the health and development of a child. Congenital malformation is a leading cause of infant mortality [1]. It's associated with social and economical impact. The etiology of congenital malformations is multifactorial.

The diagnosis of congenital malformations can be made antenatally through sonographic exam and biological tests. Although, a great number of congenital malformations are diagnosed post natally.

Studies published worldwide report a birth prevalence of congenital malformations that ranges 20-55 per 1000 live births with significant variation, depending on the demographics of the study population, the study design, and the method of case ascertainment [2].

Sex differences in several specific congenital malformations have been documented as far back as the 1940s [3]. Limited data is available concerning the sex distribution of various congenital anomaly subtypes.

This study was undertaken to estimate sex ratios in specific major congenital malformations in Maternité Souissi, CHU Rabat, Morocco.

II. Methods

Study population and cases definition:

This study was conducted in the Maternité Souissi, CHU Rabat, Morocco. Information on congenital anomalies occurring among pregnancies from January the 1st 2011 to December 31st, 2014 were extracted from the obstetric ward of Maternité Souissi, Rabat, birth register. The diagnosis of the congenital malformation was made at birth by a pediatrician. All the informations about the mother and the newborn were assessed.

Anomalies were categorized by groups and subtypes.

All cases of major congenital anomalies between January 2011 and December 2014 were included.

The frequency for males to that for females were calculated.

III. Results

During this 4 years' period, there were 68704 birth delivered at Maternite Souissi, the obstetrical department of a Tertiary teaching hospital of Rabat, the capital of Morocco.

Out of this birth number, 706 showed congenital malformations.

The prevalence rate of congenital malformations was 1.02 %. 11 newborns had sexual ambiguity, 395 were male and 276 were female (see Table 1).

This study, shows also that males newborns (57.9 %) had more congenital malformations than females (40.5%) (see Figure 1).

Male	395	57,9 %
Female	276	40,5 %
Sexual ambiguity	11	1,6 %

Table 1 : Gender frequency

IV. Discussion

The incidence of congenital malformations in our study was higher in male than in female. This is consistent with most studies made around the world [3,4]. Although, some rare studies have shown a difference with a higher prevalence of congenital malformations among female than male [5].

For Lary JM *et al,* all but two of the major categories of birth defects (nervous system defects and endocrine system defects) had a higher prevalence among males. Defects of the sex organs were eight and one-half times more prevalent among males and accounted for about half of the increased risk of birth defects among males relative to females. Urinary

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tract defects were 62% more prevalent among males, and gastrointestinal tract defects were 55% more prevalent among males. Among specific defect types, twofold or greater differences in prevalence by sex were common [6].

In Tennant study, male fetuses were significantly more prevalent in pregnancies affected by a congenital anomaly than female fetuses (RR, male vs. female = 1.15; 95% confidence interval [CI], 1.11-1.19), but there was significant heterogeneity between subtypes ($p < 0.001$). Forty-four of 110 (40%) unique subtypes were at least 40% more prevalent in males than females, with affected subtypes occurring across all major anomaly groups. Thirteen of 110 (12%) unique subtypes were at least 40% more prevalent in females than males, but the female-biased RR of a neural tube defect was less pronounced than previously reported [7].

Another study about twins have shown that 4,768 twin pairs, 225 males (4.72%) and 175 females (3.67%) had birth defects. Among opposite-sex twin pairs, males had a 29% higher risk for birth defects than their twin sisters. Compared to their twin sisters, males had a 5.4 times higher risk for pyloric stenosis and a 2.4 times higher risk for

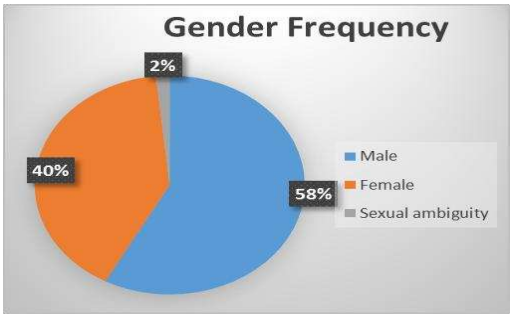

Figure 1 : Gender Frequency

obstructive genitourinary defect, but only one-tenth the risk for congenital hip dislocation [8, p. 1].

In a population based study, a total of 12,795 eligible cases of congenital anomaly were identified during the study period, including 7019 (54.9%) males and 5776 (45.1%) females. Overall, male fetuses were significantly more prevalent in pregnancies affected by a congenital anomaly than female fetuses (RR, male vs. female = 1.15; 95% confidence interval [CI], 1.11–1.19), but there was significant heterogeneity between subtypes ($p < 0.001$). Forty-four of 110 (40%) unique subtypes were at least 40% more prevalent in males than females, with affected subtypes occurring across all major anomaly groups. Thirteen of 110 (12%) unique subtypes were at least 40% more prevalent in females than males, but the female-biased RR of a neural tube defect was less pronounced than previously reported (RR = 0.84; 95% CI, 0.73–0.95 [7].

In males, the relative risk of death from spina bifida was 2.62 [95% confidence interval (CI) = 1.14-6.01]. In females, the relative risk for spina bifida was 0.59 (95% CI = 0.14-2.37). The sex ratio (male:female) for deaths from spina bifida in the exposed birth cohort was 2.74; a male predominance was not seen in any other birth cohort. Deaths from anencephaly and other central nervous system disorders did not exhibit this male predominance in the exposed birth cohort [9].

V. Conclusion

We described the effect of gender on the prevalence of CM diagnosed at birth in a tertiary teaching hospital in Rabat, the capital of Morocco.

This study adds to the growing evidence of sex-specific differences in the prevalence of a wide range of congenital anomaly subtypes

We hope that our work will serve as a foundation for future research to delineate a cause-effect relationship between gender and CM.

VI. Competing Interests

The authors declare no competing interest.

VII. Acknowledgements

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References

[1] A. Egbe, S. Uppu, S. Lee, A. Stroustrup, D. Ho, and S. Srivastava, "Congenital Malformations in the Newborn Population: A Population Study and Analysis of the Effect of Sex and Prematurity," *Pediatrics & Neonatology*, vol. 56, no. 1, pp. 25–30, Feb. 2015.

[2] S. E. Parker *et al.*, "Updated national birth prevalence estimates for selected birth defects in the United States, 2004-2006," *Birth Defects Research Part A: Clinical and Molecular Teratology*, vol. 88, no. 12, pp. 1008–1016, Dec. 2010.

[3] R. Sokal, L. J. Tata, and K. M. Fleming, "Sex prevalence of major congenital anomalies in the United Kingdom: a national population-based study and international comparison meta-analysis," *Birth Defects Res. Part A Clin. Mol. Teratol.*, vol. 100, no. 2, pp. 79–91, Feb. 2014.

[4] S. A. Madi, R. L. Al-Naggar, S. A. Al-Awadi, and L. A. Bastaki, "Profile of major congenital malformations in neonates in Al-Jahra region of Kuwait," *East. Mediterr. Health J.*, vol. 11, no. 4, pp. 700–706, Jul. 2005.

[5] I. Abdi-Rad, M. Khoshkalam, and H.-R. Farrokh-Islamlou, "The prevalence at birth of overt congenital anomalies in Urmia, Northwestern Iran," *Arch Iran Med*, vol. 11, no. 2, pp. 148–151, Mar. 2008.

[6] J. M. Lary and L. J. Paulozzi, "Sex differences in the prevalence of human birth defects: A population-based study," *Teratology*, vol. 64, no. 5, pp. 237–251, Nov. 2001.

[7] P. W. G. Tennant, S. D. Samarasekera, T. Pless-Mulloli, and J. Rankin, "Sex differences in the prevalence of congenital anomalies: A population-based study," *Birth Defects Research Part A: Clinical and Molecular Teratology*, vol. 91, no. 10, pp. 894–901, Oct. 2011.

[8] W. Cui *et al.*, "Sex differences in birth defects: A study of opposite-sex twins," *Birth Defects Research Part A: Clinical and Molecular Teratology*, vol. 73, no. 11, pp. 876–880, Nov. 2005.

[9] A. S. Brown and E. S. Susser, "Sex differences in prevalence of congenital neural defects after periconceptional famine exposure," *Epidemiology*, vol. 8, no. 1, pp. 55–58, Jan. 1997.