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Obvious Congenital Malformations in 22,899 Consecutive Newborns in Ibadan

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Summary

Marinho AO, Kalajaiye AO and Sobowale AO. Obvious Congenital Malformations in 22,899 Newborns in Ibadan. *Nigerian Journal of Paediatrics* **1987; 14:59.** The incidence of obvious congenital malformations per thousand births ascertained among 22,899 consecutive newborns at the Oluyoro Catholic Hospital, Ibadan, were 2.18 for polydactyly, 0.7 for talipes, 0.61 for anencephaly, 0.39 for hydrocephaly, 0.31 for spina bifida and 0.26 for meningocoele. These findings confirm a generally low incidence of obvious congenital abnormalities apart from polydactyly, in the population studied. Continuous monitoring is considered necessary in the face of developmental and economic changes taking place in our population, factors that will most likely alter the environment.

Introduction

THE incidence of congenital malformations in the developing world, Nigeria inclusive, has been found to be lower than that in the technologically developed world except for polydactyly[1-4]. Some of the environmental factors like nutrition and drugs that influence the occurrence of congenital malformations fluctuate[5-7]. Drugs for example, are now more freely available without prescription, to the majority of Nigerians than before, as pharmacy shops and drug peddlars spread to all parts of the country. The traditional and cultural habits are also altering to conform with Western patterns. A continuous update on data for congenital malformations is therefore necessary to complement existing records.

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Materials and Methods

All babies born between 1st January, 1981 and 31st December, 1984 at the Oluyoro Catholic Hospital, Ibadan, were examined for evidence of obvious congenital malformations. Post mortems on stillbirths and neonatal deaths were not routinely agreed to by relatives, thus limiting the study to obvious anomalies. Maternal age and parity were obtained from the case notes. For each anomaly, the incidence and occurrence by maternal age and parity

were determined. Statistical comparisons were made where relevant, using the chi-square test.

Results

There were 22,899 deliveries during the period.

Incidence according to anatomical systems and maternal age

Table I shows the obvious congenital abnormalities by anatomical system and maternal age. The incidence of total congenital malformations identified was 6.42/1,000 deliveries. Congenital abnormalities of the musculo-skeletal systems (MSS) and the central nervous system (CNS) occurred in 3.62/1,000 deliveries and 1.66/1,000 deliveries respectively. When the individual abnormalities were ranked in order of frequency, polydactyly was found to be the commonest obvious congenital abnormality, followed by talipes, anencephaly, hydrocephaly, spina bifida, exomphalos and achondroplasia (Table II).

There was a significant increase in the incidence of malformations with increasing maternal age. The incidence of total congenital malformations at 25 years or less, was significantly lower than that above 25 years ($X^2=29.6$, $p<0.001$). Similarly, the incidence at 30 years or less was significantly lower than that above 30 years ($X^2 = 14.8$, $p<0.001$) while the incidence at 31–35 years was significantly lower than that at 35 years ($X^2 = 5.6$, $p<0.02$). Abnormalities of the CNS contributed to this pattern especially above 35 years of maternal age.

The maternal age distribution with regard to the individual abnormalities produced a variable pattern. While there was a tendency towards increased incidence with increased

TABLE 1

Incidence of Congenital Malformations in relation to Maternal Age and Anatomical System

System	*Maternal Age (Years)*					*Total*
	≤20	21-25	26-30	31-35	>35	
	(*n*=6130)	(*n*=9164)	(*n*=4841)	(*n*=1831)	(*n*=933)	(*n*=22899)
Musculo-skeletal	17(2.77)	23(2.50)	25(5.16)	15(8.19)	3(3.21)	83(3.62)
Central Nervous	7(1.14)	8(0.87)	14(2.89)	2(1.09)	7(7.50)	38(1.66)
Gastro-intestinal	4(0.65)	3(0.32)	6(1.23)	1(0.54)	3(3.21)	17(0.74)
Gonadal	1(0.16)	1(0.10)	1(0.20)	1(0.54)	-	4(0.17)
Others	2(0.32)	1(0.10)	1(0.20)	1(1.09)	-	5(0.20)
Total	31(5.06)	36(3.9)	47(9.7)	20(10.92)	13(13.9)	147(6.42)

n = the number of deliveries.

Figures in parenthesis are the incidences per thousand deliveries of malformations at specified maternal ages.

TABLE II

Incidence of Individual Congenital Malformations in relation to Maternal Age

Malformation	*Maternal Age (Years)*					*Total*
	⩽20	21 - 25	26 - 30	31 - 35	> 35	
	(*n* = 6130)	(*n* = 9164)	(*n* = 4841)	(*n* = 1831)	(*n* = 933)	(*n* = 22899)
Polydactyly	7(1.14)	17(1.86)	17(3.51)	6(3.28)	3(3.22)	50(2.18)
Talipes	6(1.00)	3(0.33)	2(0.41)	5(2.73)	1(1.07)	17(0.74)
Anencephaly	4(0.65)	2(0.22)	6(1.24)	1(0.55)	1(1.07)	14(0.61)
Hydrocephaly	2(0.33)	2(0.22)	1(0.21)	2(1.09)	2(2.14)	9(0.39)
Spina bifida	-	2(0.22)	2(0.41)	-	4(4.29)	8(0.35)
Exomphalos	2(0.33)	1(0.11)	3(0.62)	-	2(2.14)	8(0.35)
Achondroplasia	1(0.16)	2(0.22)	1(0.21)	3(1.64)	-	7(0.31)
Meningocoele	-	2(0.22)	3(0.62)	1(0.55)	-	6(0.26)
Natal tooth	2(0.33)	2(0.22)	1(0.21)	-	-	5(0.22)
Harelip and Cleft palate	-	-	2(0.41)	1(0.55)	1(1.07)	4(0.17)
Hypospadias	1(0.16)	1(0.11)	1(0.21)	1(0.55)	-	4(0.17)
Chromosomal	-	-	1(0.21)	1(0.55)	2(2.14)	4(0.17)

n = number of deliveries

Figures in parenthesis are the incidence per thousand deliveries of specific congenital malformations at specified maternal ages.

maternal age for MSS abnormalities when taken together, there was a fall off after 35 years. Polydactyly showed an increase in incidence after 25 years ($X^2 = 7.9$, $p<0.01$). Talipes showed a slight fall in incidence between 21 and 30 years. Achondroplasia showed a rise in incidence at 31–35 years.

For the CNS abnormalities, there was an increased incidence beyond 35 years as compared to 35 years and under ($X^2 = 25.7$, $p<0.001$); up to 35 years, the pattern was inconsistent. Anencephaly showed an insignificant increased incidence beyond 25 years of age ($X^2 = 3.6$, $p>0.05$). Hydrocephaly showed a significant increase in incidence beyond 30 years ($X^2 = 8.9$, $p<0.01$). Spina bifida showed a significant increase above 35 years ($X^2 = 43$, $p<0.001$). Meningocoele tended to occur less frequently at the extremes of reproductive life.

Exomphalos showed an increased incidence with age beyond 35 years and natal teeth occurred with uniform frequency up to 40 years when the incidence dropped.

Incidence and parity

A similar trend to that found with regard to maternal age was also evident for parity (Table III) where again, CNS abnormalities contributed to the significant increase in incidence of total congenital abnormalities at

TABLE III

Incidence of Congenital Malformations in relation to Maternal Parity and Anatomical System

System	Maternal Parity			Total
	0 ($n = 4871$)	1 - 4 ($n = 15445$)	≥5 ($n = 2583$)	($n = 22899$)
Musculo-skeletal	16(3.28)	51(3.30)	16(6.19)	83(3.62)
Central Nervous	3(0.62)	23(1.49)	12(4.65)	38(1.66)
Gastro-intestinal	2(0.41)	10(0.65)	5(1.94)	17(0.74)
Gonadal	1(0.21)	2(0.13)	1(0.39)	4(0.17)
Others	-	4(0.19)	1(0.39)	5(0.22)
Total	22(4.52)	90(5.82)	35(13.55)	147(6.42)

n = number of deliveries

Figures in parenthesis are the incidences per thousand deliveries of specific malformations at specified parities.

parity 5 and above when compared to parity 0 - 4 ($X^2 = 22.9$, $p<0.001$). Specifically, there was a significant increase in the incidence of MSS with parity 5 and above when compared with parity 0 - 4 ($X^2 = 5.27$, $p<0.05$). Polydactyly showed an increased incidence up to parity 4 and then a slight drop in incidence at parity 5 and above, similar to that found for maternal age, but the differences were not significant ($X^2=0.8$, $p> 0.10$). Talipes showed a fall in incidence for parity 1 – 4 compared to parity 5 and above.

For CNS abnormalities, there was a general increase in incidence with increased parity especially at parity 5 and above (Table III). This occurred for all abnormalities except meningocoele (Table IV). Spina bifida had a fall in incidence at parity 3 - 4 but the incidence rose significantly at parity 5 and above ($X^2 = 20.9$, $p<0.001$).

Of the other abnormalities, exomphalos tended to increase with parity 5 and above.

A comparison of the findings in this study with those reported by other workers in Nigeria is shown in Table V.

Discussion

Hospital data tends to exaggerate the incidence of observed disease in the community especially in developing countries where financial constraints, accessibility to hospital and selective booking policies in favour of high risk patients and emergencies, reduce the number of patients attending hospital for delivery. The use of the study hospital as a data base during a free health scheme with unrestricted booking and when a specialist obstetric unit was present, partly overcame some of these problems.

The findings from the study confirm no increase in incidence of congenital abnormalities in general and in MSS and CNS abnormalities in particular when compared with previous studies from Nigeria[1-4]. The incidence of polydactyly in the present series was higher than that reported among caucasians[9] but lower than that found in Lagos[1]. Talipes was also less common in this study than in other studies from Nigeria[1-4] and caucasian data[9]. Among the CNS abnormalities, anencephaly was

TABLE IV

Incidence of Individual Congenital Malformations in relation to Maternal Parity

Malformation	*Maternal Parity*				*Total*
	0	1 - 2	3 - 4	⩾5	
	(*n*=4871)	(*n*=8836)	(*n*=6609)	(*n*=2583)	(*n*=22899)
Polydactyly	6(1.23)	15(1.70)	21(3.18)	8(3.1)	50(2.18)
Talipes	6(1.23)	3(0.34)	5(0.76)	3(1.16)	17(0.74)
Anencephaly	–	5(0.57)	5(0.76)	4(1.55)	14(0.61)
Hydrocephaly	2(0.41)	3(0.34)	2(0.30)	2(0.77)	9(0.39)
Spina bifida	–	3(0.34)	–	5(1.94)	8(0.35)
Exomphalos	–	3(0.34)	2(0.30)	3(1.16)	8(0.35)
Achondroplasia	1(0.21)	1(0.11)	2(0.30)	3(1.16)	7(0.31)
Meningocoele	–	2(0.23)	3(0.45)	1(0.39)	6(0.27)
Natal tooth	2(0.41)	2(0.23)	1(0.15)	–	5(0.22)
Harelip and Cleft palate	–	1(0.11)	1(0.15)	2(0.77)	4(0.17)
Hypospadias	1(0.21)	2(0.23)	–	1(0.39)	4(0.17)
Chromosomal	–	–	2(0.30)	2(0.77)	4(0.17)

n = number of deliveries

Figures in parenthesis are the incidence per thousand deliveries of the congenital malformation at specified parities.

commoner than hydrocephaly and spina bifida but their incidence was uniformly low when compared to caucasian[9] [10] and other Nigerian studies[1-4]. A recent hospital survey in Ibadan found an incidence of spina bifida cystica of 0.34 in 35,248 live babies for the first year of study[11] which is similar to the 0.35 incidence found in the present study. However, the overall incidence in that two-year study on 69,484 births was 0.46, demonstrating the variation of statistics from year to year. The incidence of anencephaly in our study is similar to the 0.46 incidence for Japan[12]. Of the other abnormalities, natal tooth is mentioned because of problems the mother may have in suckling. Such teeth are usually removed shortly after delivery. Harelip and cleft palate occurred with a lower frequency than in the other studies[1-4] and is much less common than in caucasian series which quote 1.2/1,000 deliveries[10]. Although no direct link has been found between oral clefts and the use of diazepam in pregnancy[13], the effects of increasing use of the drug in the population need to be monitored closely.

The incidences of obvious chromosomal abnormalities and hypospadias were also low. The general increase in incidence of congenital malformations with age and parity confirms findings elsewhere[10].

TABLE V

Comparative Incidences of some Individual Congenital Malformations in Nigerian Newborns

Malformation	*Ibadan (UCH) (Platt[3]) (1961-64)*	*Ibadan (Adeoyo) (Gupta[2]) (1964)*	*LIMH (Lesi[1]) (1966-67)*	*Benin (UBTH)+ (Oronsaye & Okpere[4]) (1973-79)*	*Ibadan (Oluyoro) (Present Study) (1981-84)*
	(*n*=4148)	(*n*=4220)	(*n*=16720)	(*n*=12028)	(*n*=22899)
Polydactyly	2.2	2.8	8.7	-	2.2
Talipes	2.4	2.4	1.1	-	0.7
Anencephaly	1.2	0.9	0.8	1.1	0.6
Hydrocephaly	2.7	2.1	0.4	0.7	0.4
Spina bifida	-	0.7	0.4	0.6	0.4
Exomphalos	0.7	0.2	0.1	-	0.4
Achondroplasia	0.3	0.5	0.1	-	0.3
Meningocoele	-	0.7	0.1	-	0.3
Natal tooth	-	-	-	-	0.2
Harelip and Cleft palate	-	0.9	0.4	-	0.2
Hypospadias	-	-	0.2	-	0.2
Chromosomal	-	-	0.5	-	0.2
ALL CNS	4.6	5.2	1.4	2.74	1.7
ALL MSS	0.5	9.7	10.7	2.1	1.4
OVERALL	8.9	30.0	14.8	8.0	6.4

+Omitted polydactyly
n = Number of deliveries
UCH = University College Hospital
LIMH = Lagos Island Maternity Hospital
UBTH = University of Benin Teaching Hospital

The third world has become the recipient of large quantities of readily available medication of questionable quality. It also has industries producing products without adequate safeguards for disposal and dispersal of toxic wastes, thus polluting the environment. While developing countries attempt to catch up with the developed world industrially, care must be exercised so that the incidence of congenital abnormalities does not increase through environmental pollution and unnecessary ingestion of drugs. In this regard, careful monitoring of abortions and congenital malformations similar to that for Agent Orange in Vietnam[14 15] will help to identify or exclude effects of the environment, drugs and chemicals on the unborn foetus.

The elimination of birth defects is the long term aim in developed countries[16] but early intrauterine detection is often expensive, invasive and in some situations, still experimental. As preventable causes of neonatal deaths are overcome in the developing countries, more attention can be paid to congenital malformations. The first step in this direction is the establishment of regional or area registers which will take cognisance of all deliveries in the area and record the true incidence of abnormalities.

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