An Audit of Congenital Anomalies in the Neonatal Unit of Queen Elizabeth Central Hospital. One-Year Study Period: 1st November 2000 to 31st October 2001.

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A study looking at congenital anomalies presenting to the neonatal unit at Queen Elizabeth Central Hospital was conducted with three primary objectives in mind: to assess the incidence and spectrum of congenital abnormalities in neonates born at Queen Elizabeth Central Hospital (QECH); to estimate the number neonates with congenital abnormalities presenting to the QECH from its catchment area; and to assess attendance at antenatal clinics with a view of finding out if preventative measures were instituted to avoid development of neural tube defects.

A prospective study was carried out from 1st November 2000 to 23rd November 2001 to record all neonates with externally visible congenital anomalies presenting at the neonatal unit. A research nurse recorded details of these anomalies using a questionnaire and clinical photographs were taken. Wherever possible a diagnosis of the anomaly was made. The number of children with congenital anomalies recorded during the study period was 152. 74 of these children were born at QECH and the other 78 were born elsewhere. The total number of all births at QECH during this period was 9838. This gives an estimated incidence of congenital anomalies of 7.5 per 1000 births at QECH. The Male: Female ratio of children with congenital anomalies 76: 76 (1:1). Overall, the single most frequent anomaly recorded was congenital talipes equinovarus. This accounted for 18% of all deformities. Neural tube defects and exomphalos / gastroschisis accounted for 13% of all deformities each. When split between those born at QECH and those born elsewhere, exomphalos / gastroschisis was the commonest anomaly in the referred cases, accounting for 23% of all deformities. Of the children born at QECH, 13 had neural tube defects, (1.3 per 1000 births); 11 had clubfeet, (1.1 per 1000 births); 2 had exomphalos / gastroschisis, (0.2 per 1000 birth); 14 had multiple congenital anomalies, (1.4 per 1000 birth).

94% of mother with congenital anomalies who delivered at QECH had attended antenatal clinics. Only 12 percent of the mothers had folate or multivitamin supplementation pre conception or in the first trimester of pregnancy. The majority of the mothers with children with neurotube defects were under 25 years having their first or second child and none had received folate supplementation. They therefore make an ideal

target group for preventative measures and public health education campaign.

Introduction

Registration of congenital malformations is important in establishing incidence, types and pattern of malformations seen in a community. Such information is useful as an early warning system of new teratogens in the environment, for example by the appearance of new malformations or an increase in previously rare conditions. This information is also useful in research into possible causes and methods of prevention of congenital malformations.

Congenital malformations can be inherited or acquired. Known genetic conditions account for approximately 40% of all cases. Teratogenic effects of chemicals and infection account for 7% of and cases and for the remaining 53% the cause is unknown but is probably of genetic origin.

The apparent incidence of congenital malformations is very much observer dependent. Even experts detect at birth less than 50% of malformations that ultimately become recognisable in live born infants.

Neurotube defects are known to be associated with folate deficiency. This study also aimed to assess the level of folate supplementation in pre / antenatal mothers.

Patients and Methods

From 1st November 2000 to 31st October 2001 all neonates with congenital anomalies presenting to the neonatal unit at QECH, born at QECH or elsewhere, were prospectively enrolled in the study.
A research nurse recorded demographic and clinical details on a questionnaire. Clinical photographs of the neonate were taken. All patients were shown to a consultant paediatrician and wherever possible a diagnosis was made. In some cases a diagnosis could not be made except to record the patient as having multiple congenital anomalies.

Results

During the study period, the total number of children with congenital anomalies recorded was 152. The male to female ratio was 1:1. The total number of births at QECH during this period was 9838 and out of these children, 74 had congenital anomalies giving an incidence of 7.5 per 1000 births (Table 1).

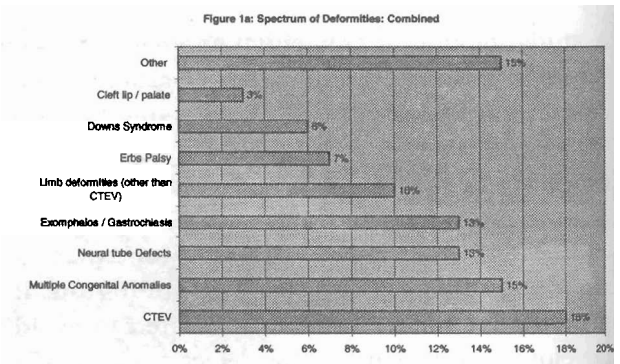
Spectrum of deformities seen

The spectrum of deformities is as shown in figures 1a and 1b. The single most frequent anomaly recorded was congenital talipes equinovarus. This accounted for 18% of all deformities. Other upper and lower limb deformities excluding clubfeet accounted for 10% of the recorded anomalies. Multiple congenital anomalies grouped children with multi system organ involvement whereby a recognisable 'syndrome' could not be identified. This group accounted for 15% of the children recorded.

Exomphalos and gastroschisis accounted for 13% of the anomalies recorded. Exomphalos and gastroschisis were the commonest congenital anomalies among the referred patients. Neural tube defects (including hydrocephalus, spina bifida, anencephaly and encephalocoele) accounted for 13% of all recorded anomalies.

Table 1

Total number of children with congenital anomalies recorded	**152**
Children with congenital anomalies born at QECH	74
Children with congenital anomalies born elsewhere	78
Total number of all children born at QECH during study period	**9838**
Male: Female ratio of children with congenital anomalies	76: 76 (1:1)
Incidence of all congenital anomalies at QECH	**7.5 per 1000**
Number of still births in children with congenital anomalies born at QECH	9
Number of neonatal deaths in children with congenital anomalies born at QECH	5



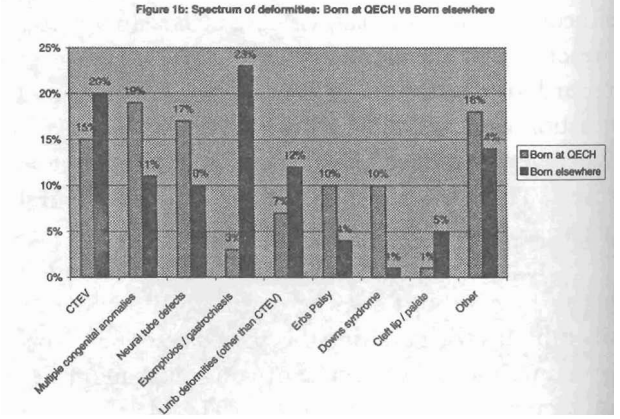


Figure 2: Spectrum of Neural tube defects

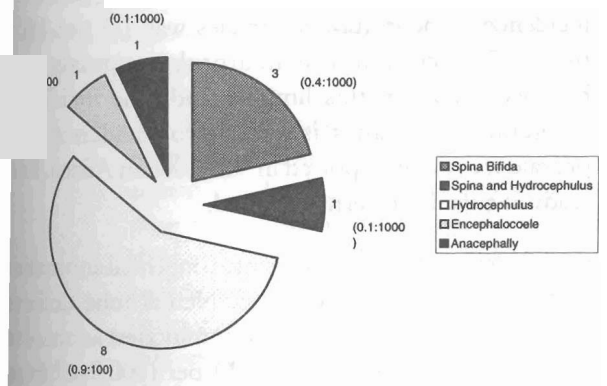
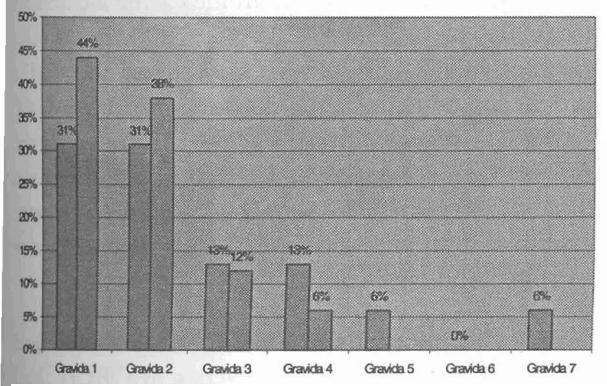


Figure 3: : Maternal Age - Neural tube Defects patients



Neural tube defects in patients born at QECH

Of the children born at QECH, 13 had neural tube defects. The distribution of the anomalies is shown in figure 2. In parenthesis is the estimated incidence of each anomaly. The total incidence of neural tube defects for children born at QECH is 1.3 per 1000 births.

The age distribution of mothers and the birth order of the child with neural tube defects born at QECH are shown in Figures 3 and 4. The majority of the mothers are under 25 years having their first or second baby.

All patients with congenital anomalies

A total of 48% of the neonates with congenital anomalies were born at QECH. The others were born at health centres; other hospitals, traditional birth attendants and at home (Figure 5).The age distribution for the parents is shown in Fig 6. The majority of the parents were under thirty years old. The birth order of the child with congenital anomalies is shown in fig 7. 31% of the mothers had the child with congenital anomalies in the first pregnancy. 22%, 13%, 14% of the mothers had the child with congenital anomalies in the second, third and fourth pregnancy respectively. There was a positive history of congenital anomalies on the maternal side in 5 patients. No history of congenital anomalies was recorded on the paternal side or in siblings of the child.

Figure 4: Birth order - Neural tube defects patients

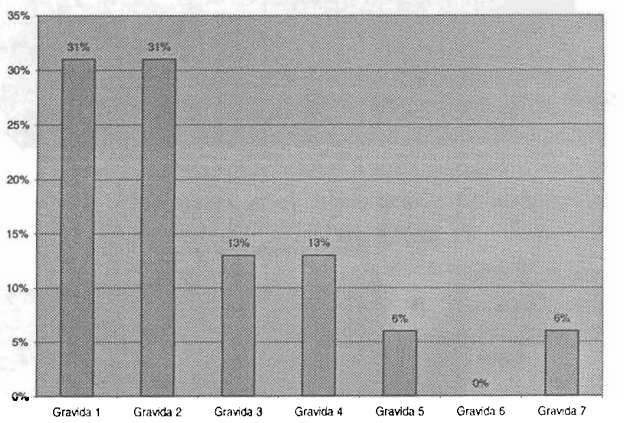


Figure 5: Place of Birth

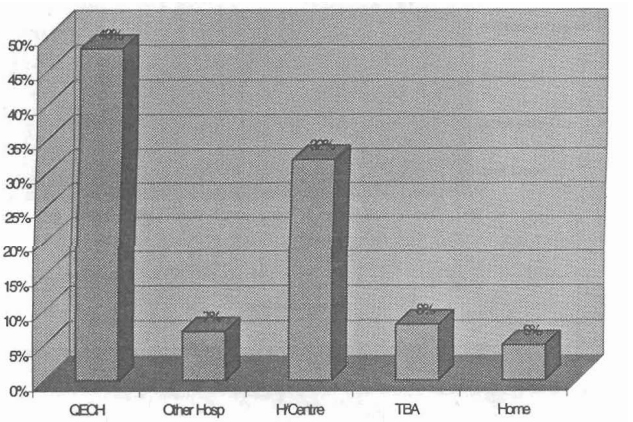


Figure 6: Age of Parents

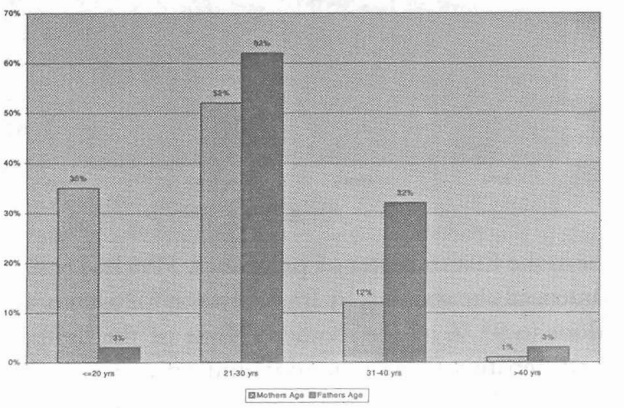


Figure 9 above: Level of education of both parents

Antenatal clinic activities for mother delivering at QECH

Ninety four percent of mother with congenital anomalies who delivered at QECH had attended antenatal clinics. Only 12 percent of the mothers had folate or multivitamin supplementation pre conception

Figure 7: Birth order of child with congenital anomalies

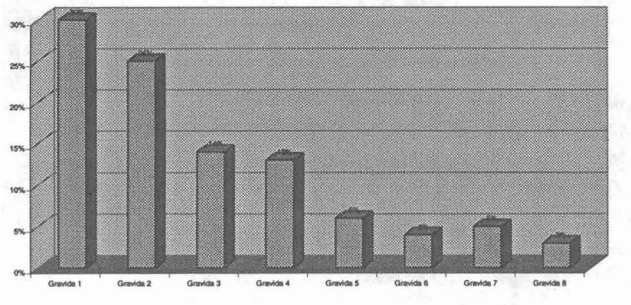
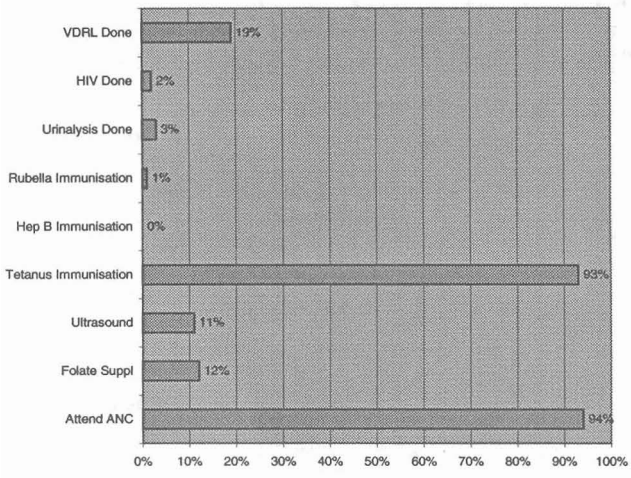
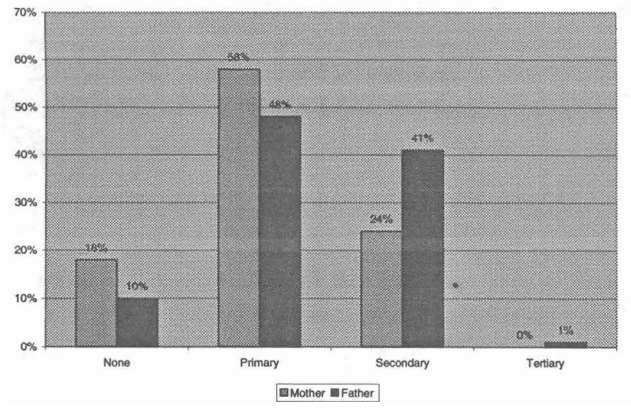


Figure 8: Antenatal Clinic Activities



Level of Education



or in the first trimester of pregnancy. 11% had had an antenatal ultrasound scan. Immunisation for tetanus was done in 93 % of the mothers. None of the mothers had hepatitis B immunisation and only one mother had rubella immunisation. Urinalysis and screening for HIV and VDRL was done in only 3%, 2% and 19% of the mothers respectively. Figure 9 shows the levels of education of mothers and fathers. The majority had either none or primary education only.

Discussion

The musculo-skeletal system was the most commonly affected system. Talipes equinovarus (clubfoot) was the commonest single anomaly seen. The incidence of all congenital anomalies was 7.5 per 1000 births. The incidence of neurotube anomalies was 1.3 per 1000 births. The commonest neurotube anomaly was hydrocephalus. In this limited study the incidence congenital anomalies is similar to incidence and prevalence studies reported in sub Saharan Africa. In a study in rural Northern Transvaal,

the incidence of externally visible congenital anomalies was 11.97 per 1000 live births. Neural tube defects and Down's syndrome were the commonest anomalies incidences of 3.5 per 1000 and 2.1 per 1000 live births respectively 1. A similar study in urban Cape Town showed an incidence of externally visible congenital anomalies of 11.87 per 1000 live births with neural tube defects and Down's syndrome having incidences of 0.99 per 1000 and 1.33 per 1000 live births respectively 2. Anyebuno, in Ghana showed a prevalence of neural tube defects of 1.15 per 1000 births 3. A 20 year experience in Cape Town reported the prevalence of neural tube defects to range between 0.63 - 1.74 per 1000 births 4. A longer and more extensive study is needed to assess the true incidence of spina bifida in Malawi.

Ninety four percent of mothers, who had children with congenital anomalies delivering at QECH, had attended antenatal clinic. This is very commendable as this would be the ideal time for public health education and implementation of preventative measures for neurotube defects. The majority of the mothers with children with neurotube defects were under 25 years having their first or second child. The prevalence of neural tube defects has been reported to be highest at the extremes of maternal age ranges i.e. <20 years and >35 years and at the extremes of birth order i.e. birth order 1 and >74. This pattern seems similar to our findings. As it is very likely that these mothers will be having more children, they are the ideal target group for preventative measures and public health education campaign. Only 12% of these mothers had folate or multivitamin supplementation preconception and during the first trimester of pregnancy. None of the mothers with children with neurotube defects were, to our knowledge, given folate supplementation to prevent similar deformities in future pregnancies.

While the 94% attendance of antenatal clinic is commendable. The poor uptake of immunisation for hepatitis B and screening for HIV and VDRL needs to be improved. This may be a reflection of the deficiency in public health education for antenatal women evidenced by the lack of enforcing preventative measures for neurotube defects by administration of folate to mothers with a history of having delivered children with neurotube defects.

Conclusions

Several conclusions have been made following this study. These are:

1. To introduce policies of folate supplementation in all women who may be considering having a child and especially in those with a history of having delivered a child with neurotube defects. Folate supplementation should be started before conception and continued throughout the first trimester

2. To intensify the public health education campaigns targeting antenatal women and ensuring that antenatal clinic screening activities are done in as many patients as possible to increase uptake of antenatal activities such as immunisations.

3. To continue recording all children with congenital anomalies as part of an effort to establish incidence figures. This will help define the extent of the problem and thus help formulate management strategies.

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