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An Autopsy Survey of Stillbirths and Neonatal Deaths at the Kandang Kerbau Hospital, Singapore

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An autopsy survey was made of the stillbirths and neonatal deaths at the Kandang Kerbau Hospital, Singapore. The survey is based on autopsies performed over a period of six months, extending from 12th, June, 1962 to 11th, December, 1962, inclusive. During this period, there were 19,765 consecutive deliveries at the hospital. There were altogether 345 neonatal deaths and 199 stillbirths. The neonatal mortality rate was therefore 17.5 per thousand total births, and the stillbirth rate 10.1 per thousand total births, the total mortality rate (neonatal deaths plus stillbirths) being therefore 27.6 per thousand total births. It may be noted that these figures are relatively low, and compare favourably with those of other countries.

Autopsy was performed on 274 of the 345 neonatal deaths and on 102 of the 199 stillbirths (97 of the stillbirths were macerated and therefore were not subjected to post-mortem examination). The autopsy rate, after disregarding all macerated stillbirths, was very high, being 84.1 per cent. In addition, autopsy was performed on 18 neonates which were delivered outside the hospital, but were admitted after delivery and had subsequently died. Thus, the total number of infants autopsied was therefore 394, composed of 102 stillbirths and 292 neonatal deaths.

Distribution Of Cases In Relation To Birth Weights

In this study, infants were divided into 8 groups according to the birth weight as follows:— 1-2 lb., 2-3 lb., 3-4 lb., 4-5 lb., 5-6 lb., 6-7 lb., 7-8 lb., and above 8 lb. A baby weighing exactly 2 lb., for instance, would be placed in the 1-2 lb. group; similarly, one weighing exactly 7 lb. would be placed in the 6-7 lb. group, and so on.

The mode of distribution of the cases in relation to the birth weight is shown in Fig. 1, from which it is noted that infants in the 3-4 lb. group were the most numerous, accounting for 28.4 per cent of the total mortality, followed by those in the 2-3 lb. group (17.8 per cent) and those in the 4-5 lb. group (16.6 per cent). Strikingly, as shown in Fig. 1, as the birth weight increased, the proportion of stillbirths rose, and above 6 lb., the majority of the infants were stillbirths.

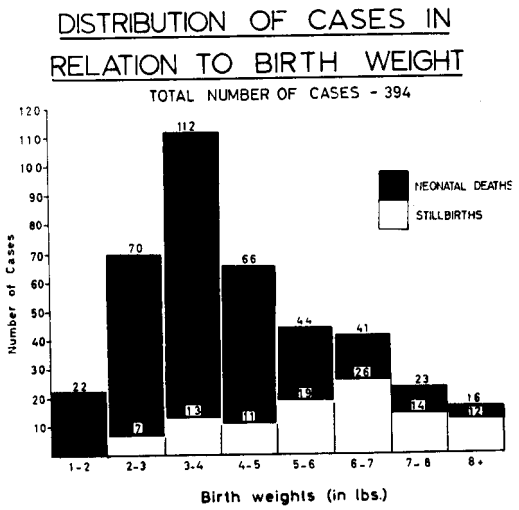

Fig. 1

Fig. 2 shows that the majority (68.5 per cent) of the babies (stillbirths and neonatal deaths taken together) were premature (i.e., 5 lb. or less in birth weight). But when only stillbirths were considered, less than one-third (30.4 per cent) were premature, whereas, on the other hand, the vast majority of neonatal deaths (81.9 per cent) were premature.

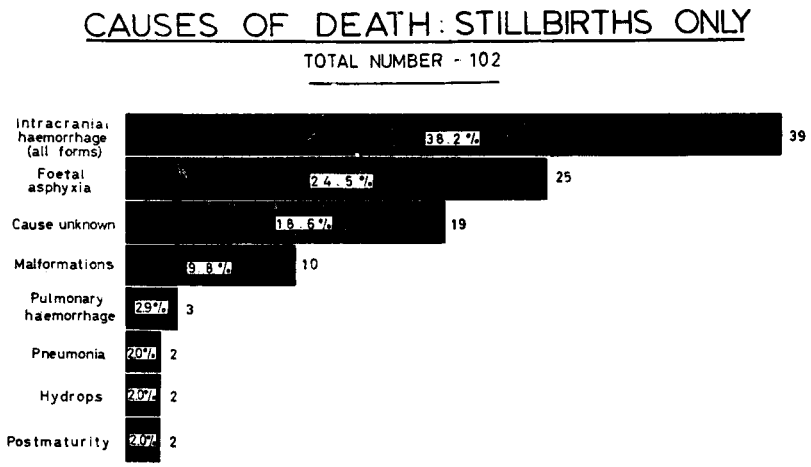

Fig. 4

(i) Intracranial haemorrhage still remained by far the most important cause of death (38.2 per cent).

(ii) Pneumonia was right down the scale, accounting for only 2.0 per cent of stillbirths. Pneumonia in the stillborn can only be of intrauterine origin, but this low figure cannot be taken to indicate a low incidence of intra-uterine infection, as morphological changes of intra-uterine pneumonia usually appear within the first few days of life.

(iii) Pulmonary haemorrhage was likewise relatively unimportant (2.9 per cent).

(iv) Foetal asphyxia (24.5 per cent) was second only to intracranial haemorrhage in frequency.

(v) Malformations were relatively frequent (9.8 per cent).

(vi) Hyaline membrane disease was not listed, as it does not occur in stillbirths.

(vii) In a significant proportion of cases (18.6 per cent), no cause of death could be found.

Neonatal Deaths Only

In considering the causes of neonatal deaths, it is necessary to separate hebdomadal deaths (deaths within the first seven days of life) from post-hebdomadal deaths (deaths occurring during the second, third and fourth weeks), as different causative factors operate in these two groups.

Fig. 5 illustrates the relative frequency of the various causes of hebdomadal deaths.

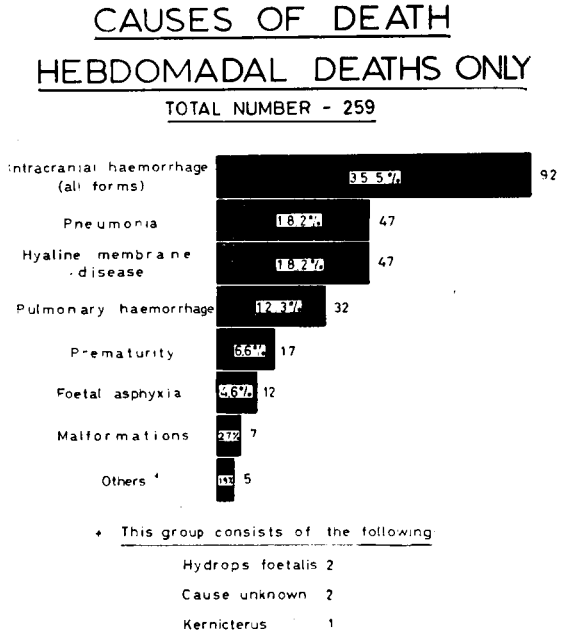

Fig. 5

It may be noted from the figure above that:-

(i) Intracranial haemorrhage was still by far the outstanding cause of death (35.5 per cent).

(ii) Pneumonia and hyaline membrane disease assumed second place in frequency (each 18.2 per cent). Most of the cases of pneumonia occurring within the first few days were presumably of intra-uterine origin. The increased importance of hyaline membrane disease is easily understood, as the disease largely affects premature babies within the first few days of life.

(iii) Pulmonary haemorrhage was common, claiming 12.3 per cent of the deaths in this period.

iv) Prematurity accounted for 6.6 per cent of the deaths, foetal asphyxia 4.6 per cent and malformations 2.7 per cent.

When the causes of death in the post-hebdomadal period are examined, a striking change in pattern is observed, as shown in Fig. 6 below:—

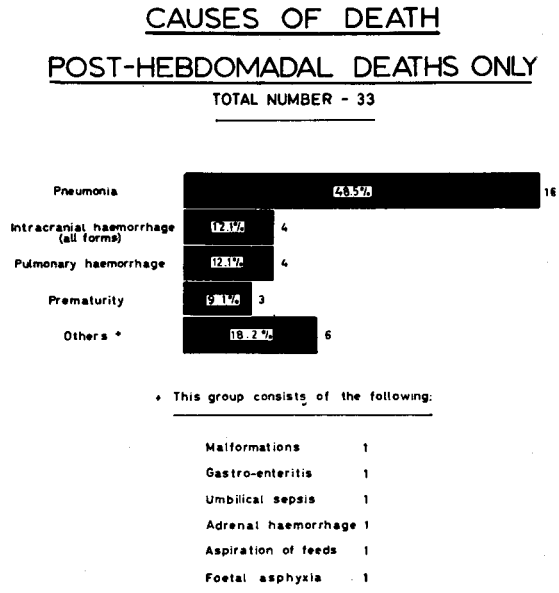

Fig. 6

Pneumonia is seen to be of paramount importance, accounting for about half (48.5 per cent) of the deaths while the other major causes were relatively infrequent. This is to be expected, as by the end of the first week, intracranial haemorrhage, hyaline membrane disease, pulmonary haemorrhage, prematurity, foetal asphyxia and malformations would have claimed most of their victims, and infection, particularly pneumonia, is the most important acquired disease of the post-hebdomadal period.