

Perinatal mortality in K. K. hospital

by

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Death in infancy can be due to many causes such as infections, congenital malformations, neoplasms, etc., but whatever the causes, they can be generally divided into 2 categories:—

- a. Those related to pregnancy and the intra-uterine state, and the early period after delivery, *viz.* those causes which are dependent to some extent on maternal and obstetric factors;
- b. Those causes which are less related to intra-uterine development and the hazards of delivery, *viz.* causes which operate much later in pregnancy.

It is found that the greater number of deaths occur as a result of factors operating in the first category, and as infections are steadily being controlled reduction in infant mortality can only be achieved by reducing deaths due to intra-uterine and obstetric causes. Before such a concerted programme can be drawn up to attack the various causes, it is imperative to study the incidence of the various causes of death which operate in this critical vital period of the infant's life, and the first thing to do is to define the period where such factors are responsible for the infant's death.

This period is called the *perinatal period* and the deaths during this period are included in the term *perinatal mortality*. Even in the delineation of this period, there is some disagreement and the different workers have taken shorter or longer periods. Fig. 1 depicts the terms usually applied to this period. Many authorities accept the perinatal period as from the 28th week of pregnancy to the end of the first post-natal week. This again is subdivided into *stillbirths*, *i.e.* deaths occurring between the 28th intra-uterine week and delivery itself; and *hebdomadal deaths* which occur in the first post-

natal week. This hebdomadal period is also called the early neonatal period in contradistinction to the late neonatal period which covers

"PERINATAL" MORTALITY-DEFINITION

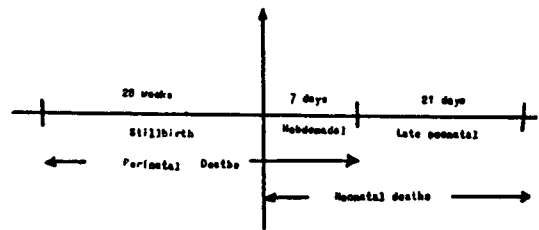


Fig. 1 Definition of terms with relevance to perinatal period.

the beginning of the 2nd post-natal week to the end of the 4th post-natal week; the first four post-natal weeks or the first 28 days of life being generally called the neonatal period.

It is obvious, therefore, if one studies the deaths in the perinatal period that many of them succumbed to one or more factors related to intra-uterine development or labour itself. For example, the premature baby with all its handicaps by itself or as a result often of concomitant obstetric complications account for about 3/4 of all perinatal deaths, and prematurity of course is due to intra-natal and obstetric factors. Again congenital malformations obviously due to intra-natal factors, whether genetic or environmental, account for a large portion of perinatal deaths. But without a systematic study of the main causes of perinatal mortality, and a study of the contributing factors which operate in any country, community or hospital,

it would be unrealistic to adopt any useful programme for the reduction of perinatal mortality in that area. From the point of view of their relative importance, such factors may differ from centre to centre. Again, facilities and finance, priorities and health programmes, types of intensities of prenatal care, methods of obstetric delivery, facilities for paediatric service, etc. are never quite the same from country to country and even centre to centre. Such an investigation needs the cooperation of the obstetrician, the paediatrician and the pathologist at the very least, and is called a *perinatal survey*. Such a survey has recently been published (The British Perinatal Mortality Survey, 1963) and is without doubt the most comprehensive to date and serves as a model for surveys of this type for any group of workers. This survey collected data on all deliveries for one week in 1958 in the whole of the United Kingdom and also studied the perinatal deaths for a period of 3 months in the same year. The immensity of the problem can be seen when it is realised that it took approximately 5 years to prepare for the actual operation of the survey and another 5 years for assessment of the data collected and its final publication. Of course, it is impossible to carry out a perinatal survey of the same magnitude in Singapore, but it is not impossible to embark on a more modest survey and limited to Kangar Hospital itself. To begin with, a Committee should be formed in the Hospital comprising initially obstetricians, paediatricians and pathologists to explore the extent and general methods whereby such a survey may be conducted, and when figures are finally available, they would be a pointer towards better obstetric and paediatric care and also indicate which parts of the survey should be continued on. The results of such a survey would be of immense value to medical workers in Malaysia.

Perinatal Deaths in K.K. Hospital

A study of the autopsy findings in infants dying in the perinatal period often reveals that the incidence of the various lesions varies from centre to centre. This is mainly due to the pathologist's interpretation as to the cause of death. Neonatal pathology is a relatively new branch of pathology, a branch which is growing

extensively recently. It is therefore understandable that figures may vary considerably. Moreover, there is an especial difficulty in the case of stillborns, because if they are macerated, it is impossible to find the cause of death and even if fresh, often it is extremely difficult to assign the immediate and paramount cause of death. Tock (1964) conducted an autopsy survey over a period of 6 months in K.K. Hospital from 12th June 1962 to 11th December 1962. The present series of cases were perinatal deaths in the same Hospital over a period of 1 year from 16th March 1964 to 15th March 1965, and the autopsy during that year were carried out by the same pathologist, Dr. M. A. Thomas. The 1962 series of Tock consisted of 19,765 deliveries of which 199 were stillbirths and 345 were neonatal deaths.

The *present series* (P.S.) consisted of the following:—

Total babies born: 39,183

Total deaths: 1,209, consisting of:—

a. *Stillbirths:*

1. Macerated: 240

2. Fresh: 270

Total: 510

b. *Live births:*

1. Hebdomadal: 618

2. Late neonatal: 81

Total: 699

Certain *frequency rates* are tabulated below, the present series (P.S.) being compared to Tock's series (T) and the figures from the British Perinatal Mortality Survey (BPMS):

	T	PS	BPMS
Total mortality rate	27.6/1000	30.8/1000	—
Perinatal mortality rate	—	28.8/1000	33.2/1000
Stillbirth rate	10.1/1000	13.0/100	—
Neonatal death rate	17.5/1000	17.8/1000*	—
Autopsy rate+	84.1%	75.5%	96.5%
Premature mortality rate (live births)	81.9%	80.7%	—
Premature mortality rate (fresh stillbirths)	30.4%	23.3%	—

* Hebdomadal deaths comprised 88.4%.

+ Excludes macerated foetuses.

Causes of Death in Various Categories

1. Stillbirth & Neonatal Deaths The present series comprised 732 autopsied cases, made up of the following with relevant figures from Tock's series and the B.P.M.S. series:—

Cause of death	Tock's series	Present series	B.P.M.S.'
Hyaline membrane	11.9%	18.8%	5.2%
Intrauterine anoxia	9.6%	19.9%	55.0%
Intracranial Haemorrhage	34.3%	16.6%	2.3%
Pulmonary infection	16.5%	9.9%	4.9%
Pulmonary haemorrhage	9.9%	6.3%	1.9%
Congenital malformations	4.6%	12.4%	18.8%
Prematurity	5.1%	2.7%	—
Gastro-enteritis	—	3.8%	—
Meningitis	—	3.7%	—
Miscellaneous	8.1%	5.9%	11.9%
TOTAL	100%	100%	100%

Fig. 1 shows in diagrammatic form the relative incidence of the various causes of stillbirths and neonatal deaths.

STILLBIRTHS & NEONATAL DEATHS

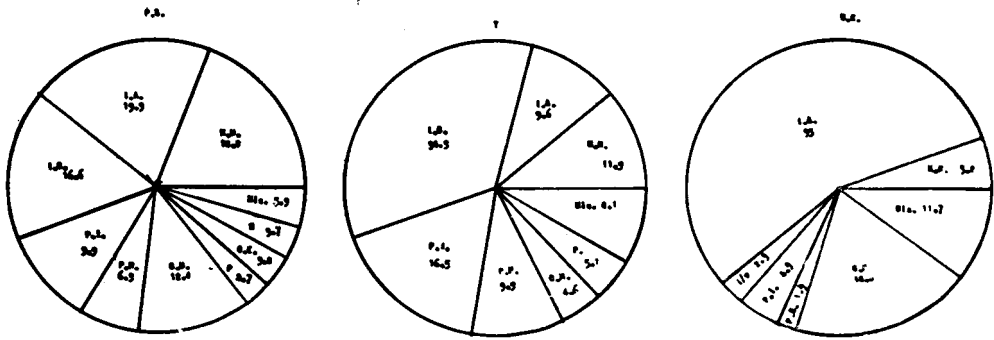


Fig. 2 Percentages of main causes of death in stillbirths and neonatal death P.S. Present series; T=Tock's series; U.K.—B.P.M.S. series, H.M. Hyaline membrane; I.A.=intra-uterine anoxia, I.c=intracranial haemorrhage; P.I.=pulmonary infection; P.H.=pulmonary haemorrhage; P.=prematurity; C.M.=Congenital malformation; G.E.=gastroenteritis; M=meningitis; Mis=miscellaneous.

2. Stillbirths Only

The present series comprised 171 autopsied cases, made up of the following with relevant

figures from Tock's series and the B.P.M.S. series:—

Cause of death	Tock's series	Present series	B.P.M.S.*
Intrauterine anoxia	24.5%	76.6%	74.7%
Congenital malformations	9.8%	14.6%	17.5%
Intracranial haemorrhage	38.2%	4.7%	—
Hydrops foetalis*	2.0%	2.9%	4.4%
Prematurity	—	0.5%	—
Pulmonary haemorrhage	—	0.7%	—
Others	25.5	—	3.4%
TOTAL	100%	100%	100%

* Hydrops in K.K. Hospital is due to Bart's Hb while in U.K. it is due to Rh isoimmunisation.

Fig. 3 depicts the relative incidence in diagrammatic form.

STILLBIRTHS ONLY

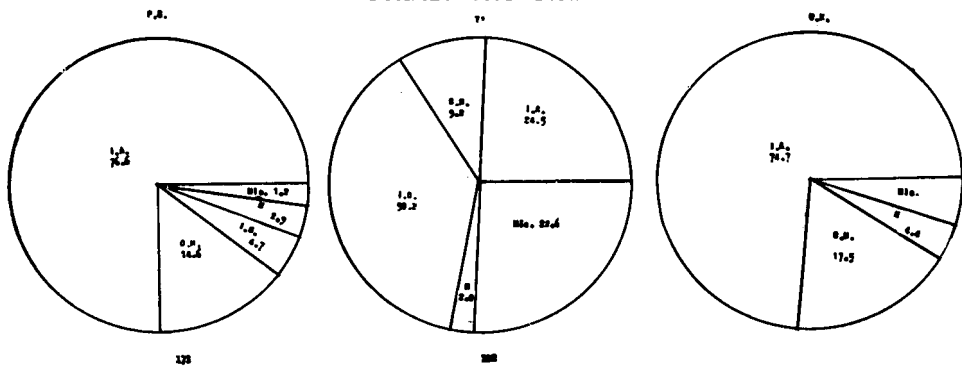


Fig: 3 Percentages of main causes of death in stillbirths only. P.S.=present series; T=Tock's series U.K.=B.P.M.S. series I.A.=intra-uterine anoxia, C.M.=congenital malformations; I.C.= intra cranial haemorrhage; H=hydrops foetolis M.S.=miscellaneous.

3. Hebdomadal Deaths Only

The present series comprised 485 autopsied hebdomadal deaths made up of the following

with comparisons with Tock's series and the B.P.M.S. series:—

	Tock's series	Present series	B.P.M.S.
Hyaline membrane	18.2%	28.4%	15.0%
Intracranial haemorrhage	35.5%	25.0%	6.4%
Pulmonary infection	18.2%	11.1%	13.3%
Pulmonary haemorrhage	12.3%	9.5%	5.9%
Congenital malformations	2.7%	13.6%	21.6%
Prematurity	6.6%	3.7%	—
Intra-uterine anoxia	4.6%	3.1%	19.6%
Others	1.9%	5.6%	18.2%
TOTAL:	100%	100%	100%

HEBDOMODAL DEATHS ONLY

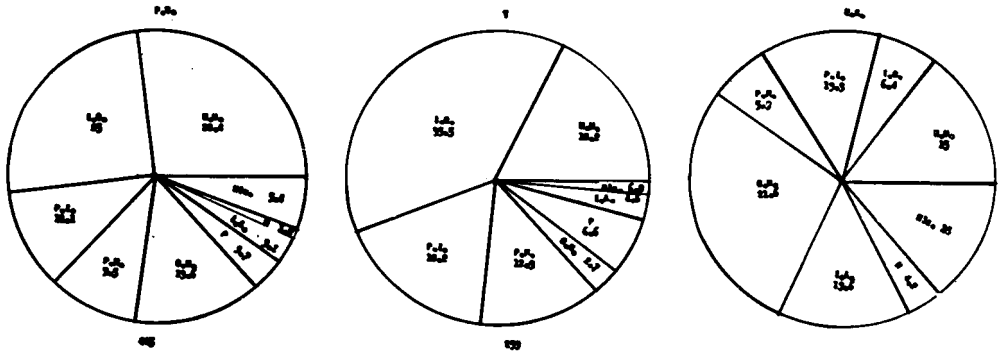


Fig. 4 Percentages of main causes of death in hebdomodal period only P.S.=present series; T=Tock's series, U.K.=H.M. hyaline membrane; I.C.=intra-cranial haemorrhage; P.I.=pulmonary infections; P.H.=pulmonary haemorrhage C.M=Congenital malformation; P=prematurity; IA=intra-uterine anoxia; M.S.=miscellaneous.

4. Late Neonatal Deaths Only

The present series consisted of 76 autopsied cases and this is compared to Tock's series.

	Tock's series	Present series
Meningitis*	—	33%
Gastro-enteritis*	—	36.5%
Pulmonary infection	48.5%	24.0%
Intracranial haemorrhage	12.1%	2.6%
Prematurity	9.1%	1.3%
Pulmonary haemorrhage	12.1%	—
Others	18.2%	2.6%
TOTAL:	100%	100%

* The high incidence of these 2 infections was due to a gastro-enteritis outbreak in the 2 premature nurseries during the present survey.

Acknowledgement

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Reference

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