

FOURTH SESSION

Medical Aspects

Perinatal Mortality

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PERINATAL MORTALITY

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INTRODUCTION

Perinatal mortality was defined as "Death after the 28th. eweek of gestation and deaths in the Ist. week of life expressed per 1000 live and still birth°

In 1970 the WHO Expert Committee on prevention of perinatal mortality and morbidity revised that definition, taking into consideration that the gestational age is very difficult to estimate accurately in many places where the L.N.M.P. is not recalled by the mother and that estimation by other methods is far from accurate.

They also reconsidered the definition of live birth and suggested that the birth weight should be used as a criterion instead of the gestational age. Thus they recommended the following definitions:—

(a) *Fetal Deaths*

Group	Live birth	Fetal death
I	Up to & including 500 gm.	Up to and including 500 (Early Foetal Death)
II	Over 500gm & up to & including 1000 gm.	Over 500 gm up to including 1000 gm ((Intermediate Foetal Death)
III	Over 1000gm	Over 1000gm (Late Foetal Death)

(b) *Early Neonatal Death:*

Death in first week of life; the week being the number of hours that elapsed between birth and death, i.e. 168 hours.

(c) *Perinatal Mortality Ratio:*

Late foetal and early neonatal deaths weighing more than 1000gm. expressed per 1000 live births, weighing more than 1000gm.

THE SIZE OF THE PROBLEM

(a) *In East Africa:*

Brown and Sandhu (1966) in an autopsy survery from 1953-1964 examined the autopsy records of 47010 births in Mulago Hospital in Kampala. From 1094 autopsies, they found that :—

Still birth rate	54.43/1000 still & live birth
Neonatal Mortality rate	32.31/1000 live birth
Perinatal Mortality rate	86.74/1000

Unfortunately they defined their perinatal mortality as still birth and death in the first twenty eight days.

Versluys and Casson (1975) in a prospective study in Kilimngaro Christian Medical Centre in Tanzania, examined 2225 deliveries in nine months - their figures were :—

Still birth rate	33/1000 still & live birth
Early neonatal death rate	21/1000 live birth
Perinatal mortality	54/1000

The figures are hospital based and it is a main referral hospital.

Holmes (1973) in observations in 1500 births in the same hospital found:

Still birth rate	37.3/1000 still & live birth
Early neonatal death rate	20.8/1000 live birth
Perinatal mortality rate	58.1/1000

Koten (1968) in Nairobi found that among 300 autopsies carried out there :—

- 33 were still born
- 13 were first week deaths.

Ebrahim (1969) in Ocean Road Hospital, Dar es Salam, examined 10,778 births:—

Still birth rate	29.4/1000 still & live birth
Early neonatal death rate	14.6./1000 live birth
Perinatal mortality rate	44.0/1000

The same author, Ebrahim (1966) in Kampala, reported a

Still birth rate	30/1000
Early neonatal death rate	20/1000
Perinatal mortality rate	50/1000

(b) West Africa

Nylander (1971) in a survey in three hospitals in Ibadan, investigated 12,089 pregnancies and estimated the perinatal mortality rate as 60.7/1000. It was a prospective study over one year (1967/1968).

CAUSES

From all the studies certain factors appeared to contribute to the higher perinatal mortality rate. Some are directly related to the poor socio-economic situation prevalent in most developing countries, with very

little and sometimes no maternal and child health services. Others are due to the cultural set up of the community and problems related to urbanisation. Maternal health, before and during pregnancy and at delivery, contribute markedly, while the post-natal environment and certain conditions in the newborn add their share.

In many developing countries there is a very high birth rate, problems of over-population and difficulties in getting family planning services going, either for lack of facilities, organisation or most commonly, religious and social opposition. The large family is the rule and polygamy is common in some societies. Coupled with this is the very low national productivity and incomes and in many places the earnings are just enough to keep people alive.

Illiteracy is very high and illiteracy rates above 95% are common. 80% of the population lives in rural areas and services are rudimentary. Communications are very difficult and often the journey to the nearest health post might take days.

Emerging from all these factors are large families with no spacing what so ever, in poor socio-economic conditions and scarcity of maternity and child health services. Birth rates are high and perinatal mortalities are very much so.

Added to all these are problems associated with urbanisation and the the emergence of shanti dwellings and city slums with overcrowding, poor hygiene and high illegitimate birth rates.

MATERNAL FACTORS:

(a) *Nutrition:*

In most places malnutrition and undernutrition is very prevalent. Maternal health is the outcome of good nutrition. In many places maternal height is markedly reduced. The risks to babies born to mothers below 5 ft. in height is well documented and the incidence of obstructed, prolonged labour and caesarean section are high.

Rickets in childhood might lead to deformity of the pelvis with obstetric complications later on.

The role of maternal anaemia during pregnancy will be discussed later.

In certain societies the situation is aggravated by certain cultural beliefs and taboos that are positively harmful, i.e. in Burma the pregnant mother had to be restricted from some foods.

(b) *Maternal age:*

In many countries there is a tendency for early marriage, i.e. India,

Northern Nigeria and the Middle East. 14-16 years is a common age for the first pregnancy Butler & Bonham (1968) have shown that a mother under 20 years of age has 23% more chance of losing her baby due to placental insufficiency than after 20 years, while over 40 years, the risk is twice the average risk.

In the Pan American Study (1973) the findings were similar to those. The safest group was a mother between 20-29 years of age. Mortality is higher less than 20 years and rises steeply after 35 years of age

TABLE I:
P.M.R. By Maternal Age:

						Nylander (1971)
Age (years)	15-19	20-24	25-29	30-34	35-39	401
P.M.R.	61	47	62	70	86	87
No. of babies	1670	3903	3852	2442	773	169

Nylander (1971) in Ibadan reached similar conclusions see table 1

(c) *Parity and birth order:*

Butler and Bonham (1973) have shown that there is an increased perinatal mortality with higher parity and that the second child has the lowest mortality which increases sharply after the fourth. Ebrahim (1969) reported a higher incidence of low birth weight and perinatal mortality after the fifth child is higher than the second, 3rd and 4th. Nylander (1971) recorded similar conclusions in Ibadan.

MATERNAL FACTORS RELATED TO PREGNANCY AND DELIVERY

1. *Conditions incidental with pregnancy*

Many conditions that occur throughout the world and contribute adversely to the outcome of pregnancy cause a higher perinatal mortality either by direct effect or through premature labour and/or small birth weight. Maternal disease like renal disease, heart disease, hypertension, diabetes and syphilis are well reported.

Hyperpyrexia due to any cause can induce premature labour or cause still birth.

Two maternal diseases that need special stress are malaria and anaemia as contributory causes to perinatal mortality.

TABLE II:

STUDY	Total No. of Placental	Positive		Percentage Prematurity		Mean Birth Weight (gms)		Difference (gms)
		No.	%	-ve	+ve	-ve	+ve	
Bruce-Chwatt (1957)	310	73	23.5	11	20.5	3048	2903	+ 145
Archibald (1956)	463	68	14.7	16.5	29.4	2892	2772	+ 120
Archibald (1958)	446	62	14.1	8.2	21.0	3076	2778	+ 298
Cannon (1968)	392	130	33.2	12.2	36.9	2920	2610	+ 310
Spitz (1959)	576	136	23.6	27.0	41.2	—	—	+
Mclaran & War (1962)	400	86	21.5	7.3	14.6	3092	3037	+ 55
Jelliffe (1968)	570	92	16.1	10.0	19.6	3063	2085	+ 978

Malarial Infection of the Placenta and birth weight – Studies from 1952–1965 in West and East Africa (Jelliffe (W.H.O. Bulletin, (1968) 38, 69)

MALARIA

Malaria contributes in late foetal or early neonatal mortality in more than one way. Malaria as a cause of hyperpyrexia induces premature labour. While through parasitaemia of the placenta it is well documented that malaria is a cause of low birth weight in endemic or hyper-endemic areas. It was also shown that placental parasitaemia decreases with parity in hyper-endemic areas due to build up of immunity and that this effect in birth weight is most noted in the first pregnancy.

Bruce-Chwatt (1953), Archibald (1956), Cannon & Spitz (1959), Jellife, (1968) have documented this in the published works from west and east Africa. (See Table II)

In addition Malaria contributes to anaemia in pregnancy. (Gilles & Lawson, 1969)

Morley (1964) in a study of 400 pregnant women receiving regular prophylaxis during pregnancy with pyrimethamine, showed that there is a difference of 5½ oz. in mean birth weight of the babies, as compared with a control group who did not have any prophylaxis.

ANAEMIA

Johnson & Ojo (1967) studied the outcome of 234 pregnancies with severe anaemia and showed that there is 41% foetal wastage in 89 cases) with haematocrits less than 12% and 13% in haematocrits between 13-24% (151 cases).

In areas of endemic malaria, haemolytic anaemia and folate deficiency anaemia are common and usually coincide with the period of peak malaria transmission (Gilles & Lawson, 1969).

Where Sickle Cell Disease occurs it was shown that the A/S genotype mothers had an increased perinatal mortality when there is anoxic stress (Platt, 1971) This might be a result of in vivo sickling in placental vessels leading to low oxygen tension in foetal circulation and amniotic fluid. (Johnson & Ojo, 1967) thus sickle cell traits need special attention during late pregnancy and labour.

COMPLICATIONS OF PREGNANCY

Among causes that contribute to perinatal mortality in different studies are:—

- Toxaemia and Eclampsia
- Antipartum haemorrhage
- Poly-hydramnios
- Multiple pregnancy

Prolapsed cord
Prolonged rupture of the membranes
Malpresentation.

are all individual risk factors which contribute to perinatal mortality mainly through placental insufficiency intrapartum asphyxia and prematurity.

Prolonged Labour-Birth Trauma and Asphyxia

This group stands out as one of the major factors contributing to high perinatal mortality and it is an area where prevention is possible and there is a lot of room for improvement so avoiding unnecessary deaths.

Brown and Sandhu (1966)– Birth trauma and asphyxia accounted for 20% of all still births and was the major cause among deaths in the first week.

Versluys (1975) in his series had 20% of still births due to prolonged labour and 45% of early neonatal deaths due to birth trauma/hypoxia.

Postnatal Factors

Low birth Weight: It comprises both preterm babies and light for dates

In many studies L.B.W. was a contributing factor in early neonatal deaths.

Ebrahim (1965) showed that out of 6206 newborns 311 were less than 4 lbs. 8oz an incidence of 4.8% Mortality in the first week ranged from 70-100% in those below 2 lbs .B.W. It was 35% for those between 2-3lbs. Compared with 3.39% for those above 4.8lbs. Thus 76% of all neonatal deaths occur below 3lbs.

Versluys and Cannon reported an early neonatal mortality of 43% from low birth weight/asphyxia.

Brawn & Sandhu reported that 61.4% of neonatal deaths are associated with low birth weight.

Nylander in Ibadan found that the highest mortality is between 28-33 weeks of gestations and it is higher in multiple pregnancies.

The immediate causes of death are mainly due to R.D.S., infection, hypoxia.

Congenital Malformation

In most of the series this was not a prominent factor compared to series in U.K. (Butler, Bonham) factors to be taken in consideration are under reporting due to cultural and social beliefs.

Haemolytic Disease of the Newborn

Was also of low incidence. In most of the series difficulties in diagnosis unless actively looked for might play a role.

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