

Incidence of Idiopathic Respiratory Distress Syndrome (IRDS) among Neonates in Enugu

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Summary

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Incidence of Idiopathic Respiratory Distress Syndrome (IRDS) among Neonates in Enugu. In order to determine the incidence of idiopathic respiratory distress syndrome (IRDS) in an institution in Nigeria, a prospective study was undertaken from December, 1973–November, 1975. All newborns weighing 2500 gm or less at birth, were closely watched for the development of the syndrome. Out of 235 preterm newborns, 6 (including 2 offsprings of diabetic mothers) satisfied the clinical and radiological criteria for the diagnosis of IRDS. There were two deaths, giving a mortality of 33 per cent in the series. This incidence of the syndrome in the present study is much lower than those reported from other parts of the world. Further studies are required to elucidate the aetiological factors which determine this difference in incidence.

IDIOPATHIC respiratory distress syndrome (IRDS), also known as hyaline membrane disease, is a symptom-complex that affects mostly preterm newborns. According to the World Health Organisation (WHO), any liveborn infant delivered before 37 weeks from the first day of the last menstrual period, is considered to have a shortened gestational period and therefore preterm or premature. Infants who weigh 2,500 gm or less at birth are considered to have either a shortened gestational period or less than expected rate of intrauterine growth or both, and are termed infants of low birthweight. The average

birthweight of neonates delivered in the University of Nigeria Teaching Hospital is 2,900gm which is similar to the reported mean birthweight in Ibadan (Effiong, *et al.* 1976).

IRDS has been reported from many parts of the world (Silverman and Silverman 1958; Avery and Oppenheimer 1960; Sivanesan, 1961; Webb, *et al.*, 1962; Younozai, 1962); it is a leading cause of death among liveborn preterm infants (Driscoll and Smith 1962). The present prospective investigation was undertaken because, to our knowledge, there has been no published work on the syndrome in Nigeria.

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Materials and Methods

During the two-year period (December 1973 to November 1975), all Nigerian babies born at the University of Nigeria Teaching Hospital (UNTH), Enugu, were closely observed for the development of IRDS. Special attention was paid to any newborn weighing 2,500 gm or less, and also to all newborns in this category as well as those of diabetic mothers. They were managed in the Newborn-Special-Care-Unit. All newborns outside the above-named categories were "roomed-in" with their mothers, but the physicians in charge of the Newborn-Special-Care-Unit also supervised their care so as to expedite prompt work-up and management of those who may develop problems, respiratory or otherwise.

All newborns weighing 2,500 gm or less were examined by at least one of us within the first 24 hours of life so as to assess the gestational age, using the criteria described by Farr, *et al.*, (1966) and modified by von Bernuth and von Harnack (1971). Diagnostic criteria used in the present study included:

- (a) *Clinical*: The presence within six to eight hours of delivery, of expiratory grunting or whining when the infant is not crying; respiratory rate of 50 or more per minute; sternal and intercostal retraction.
- (b) *Radiological*: A chest radiograph showing reticulogranular or groundglass appearance with air bronchogram
- (c) *Metabolic*: Presence of respiratory acidosis.
- (d) *Necropsy*: Collapsed, dark-red firm lungs which on microscopy show alveolar collapse with over-distension of the dilated alveolar ducts and pink-staining membrane on alveolar ducts as well as thickening of the muscular coat of the pulmonary arteriolar walls.

All newborns who died were subjected to necropsy.

Routine measures in the care of affected babies included the insertion of umbilical arterial and

venous catheters, intravenous infusion of 10 per cent glucose solution in appropriate volumes, assessment of acid-base balance when practically possible, and treatment of respiratory acidosis with infusions of sodium bicarbonate. The blood sugar was also monitored with Dextrostix Eyetone (Ames Company).

Results

During the two-year period, there were 4,296 livebirths. Of this number, 235 (5.45 per cent), made up of 111 males and 124 females, were preterm. The birthweights in the preterm infants are shown in Table I. One hundred and three (43.83 per cent) weighed between 1,501 and 2,000 grams while only 6 (2.55 per cent) and 5 (2.13 per cent) weighed less than 1,000 grams and above 2,500 grams respectively. 70 newborns (29.79 per cent) weighed between 2,000 and 2,500 grams

TABLE I
Birthweight of 235 Preterm Newborns

| <i>Birthweight (gm)</i> | <i>No. of Cases</i> | <i>Per cent of Total</i> |
|-------------------------|---------------------|--------------------------|
| less than 1000 | 6 | 2.55 |
| 1001-1500 | 51 | 21.70 |
| 1501-2000 | 103 | 43.83 |
| 2001-2500 | 70 | 29.79 |
| above 2500 | 5 | 2.13 |
| Total | 235 | 100.00 |

Six (2.6 per cent) of the 235 preterm newborns developed respiratory distress syndrome. Two of these, both weighing more than 2,500 grams, were offsprings of diabetic mothers. The obstetric history, gestational age, birthweight and outcome of the six babies are summarized in Table II. The gestational age ranged between 30 and 36 weeks. Of the six patients, two (33.0 per cent) died.

TABLE II
Obstetric History, Gestational Age, Birthweight and outcome in Six Infants with IRDS

| Patient | Obstetric history | Gestational age | Birthweight (gm) | Outcome |
|---------|---------------------------------------|-----------------|------------------|----------|
| 1. | Twin pregnancy | 34 weeks | 1400 | survived |
| 2. | Premature rupture of membranes | 32 weeks | 1400 | died |
| 3. | Antepartum haemorrhage | 34 weeks | 1500 | died |
| 4. | Premature rupture of membranes | 30 weeks | 1200 | survived |
| 5. | Caesarean section for foetal distress | 36 weeks | 3600 | survived |
| 6. | Caesarean section for foetal distress | 36 weeks | 3500 | survived |

Discussion

Although the period of the study was short, the prevalence of IRDS in Enugu as revealed by the present study is much lower than that reported from the U.S.A. (Silverman and Silverman 1958; Avery and Oppenheimer 1960; Driscoll and Smith 1962); Lebanon (Younazai, 1962); Singapore (Silvanesan, 1961) and India (Webb, *et al.*, 1962).

Avery and Oppenheimer (1960) have reported an incidence of 3.8 per 100 livebirths and a mortality of 38.8 per cent among 56 newborns weighing between 1,000 and 2,000 grams. Similarly, Silverman and Silverman (1958) in their series of 96 newborns, recorded an incidence of 13.8 per 100 livebirths and a mortality of 53 per cent. Of these 96 cases, 19 (20 per cent) weighed less than 1,000 grams at birth. This high mortality was probably due to the then-prevailing empirical methods of management. Silvanesan (1961) in his series of 119 newborns, 86 per cent of whom weighed between 1,000 grams and 2,000 grams, recorded a mortality of 33 per cent. The two deaths in the present study occurred among newborns who weighed between 1,000 and 1,500 grams at birth.

The reason for the low incidence of IRDS in our environment is unknown. Recent reports from the USA indicate that among black preterm infants, the incidence of the disease is lower than among the Whites (Farrell and Wood, 1976), thus suggesting a racial factor in the cause of the

disease. Further studies of this syndrome in Nigeria are required to determine the causes for its low prevalence.

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