

Should neonates with specific “risk factors” be admitted to the special care nursery?

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Summary

Existing criteria for admission of newborns to the special care nursery, Sarawak General Hospital, resulted in the admission of many neonates with certain risk factors (“at risk” neonates). To test whether such babies could be safely and better cared for in postnatal wards, 392 of these babies were randomly allocated into two groups. One group of 196 was admitted to the special care nursery and the other group of 196 was cared for with their mothers in the postnatal wards. The two groups were compared for mortality, morbidity and breastfeeding. There was no significant difference in mortality and morbidity between the two groups. While in hospital a larger proportion of babies cared for in postnatal wards were breastfed, compared to babies admitted to the special care nursery. In addition, they initiated their breastfeeding earlier. Babies with these risk factors should therefore be cared for with their mothers in the postnatal wards.

Key words: Neonates, Criteria for admission, Special care nursery, post-natal wards.

Introduction

The Sarawak General Hospital (SGH) in Kuching is a 717 bed regional hospital for the state of Sarawak which has a population of about 1.5 million in 1988. It was noted that the admission rate of babies to the special care nursery (SCN) in SGH was high compared to other hospitals. The rate in SGH was 339 per 1000 livebirths in 1987.¹

The average total admissions to the SCN was about 260 a month. It was noted that about 80% of these were babies were admitted for one or more of the following reasons (risk factors):

- Born after caesarean section
- Born after instrumental delivery (forceps, vacuum)
- Breech delivery
- Maternal sedation
- Large for age (> 4.0 kg)
- Moderate or thick meconium stained liquor

- Born before arrival
- Maternal illness (eg. PTB, Thyrotoxicosis)
- Congenital abnormalities (Not life threatening)

Studies have shown that admission to special care nurseries may have the following adverse effects:

1. Nosocomial infections^{2, 3, 4}
2. a) Late initiation of breastfeeding
b) Delayed development of full lactation in mothers.^{5, 6}
c) Reduction of duration of breastfeeding.^{7, 8}
3. Impaired maternal-child bonding with long term adverse effects e.g. child battering and non-organic failure to thrive.^{9, 10, 11, 12}

Other studies have shown that babies with similar risk factors can be cared for with their mothers in the postnatal wards without increased morbidity and mortality.^{13, 14, 15}

Objectives

General Objective: To verify that babies with certain specified risk factors may be safely and better cared for in the postnatal wards.

Specific objectives:

1. To verify that babies with certain specified risk factors who would have previously been admitted to the Special Care Nursery, may now be cared for with their mothers in the postnatal wards without an increase in mortality or morbidity.
2. To determine whether there is a difference in breastfeeding practices between such babies when they are cared for in the postnatal wards compared to when they are admitted to the special care nursery.

Materials and Methods

The existing criteria for admission to the special care nursery in SGH were reviewed. Criteria for admission to special care nurseries of other hospitals were obtained and studied.^{15, 16} Discussions were held with staff of the obstetric and paediatric units in SGH regarding these admission criteria. It was decided by consensus that babies of at least 37 weeks gestation and with Apgar score of at least seven at five minutes, with the following conditions should not be admitted to the SCN:

- Forceps delivery
- Breech delivery
- Meconium staining without respiratory symptoms
- Babies with minor congenital malformations (e.g. Down's Syndrome, cleft lip and/or palate)
- Maternal sedation
- Cord round neck or traumatic cyanosis
- Certain maternal illness: Thyrotoxicosis, VDRL positive, HBs Ag positive

The above conditions were criteria for inclusion into the study. The study was conducted on 392 babies who were delivered in SGH between September 3 and November 14, 1988 and had one or more of the conditions listed, but had no other condition that would justify admission to the SCN. All babies were examined by trained paediatric staff nurses in the special care nursery. Babies that were to be included in the study sample were then randomly divided into two groups. One group was admitted to the special care nursery. Mothers who wanted to breastfeed their babies in the SCN were encouraged to do so at anytime by going to an area in the SCN allocated for the purpose. The other group was sent to their mothers in the postnatal wards. Babies in both groups were examined daily by doctors in the paediatric unit. Information on morbidity, mortality and breastfeeding was collected during the stay in hospital and at a follow-up interview set six weeks after delivery. Data was collected by trained medical and health personnel using a recording form.

Criteria for admission to the SCN are listed in Table 1.

Table 1

Revised Criteria for Admission to the Special Care Nursery, Sarawak General Hospital, Kuching.

1. Birth weight less than 2.0 kg.
 2. Period of gestation less than 37 weeks (* N.B. Parkins score to assess gestational age when in doubt).
 3. Apgar score less than 7 at five minutes or requiring intubation at birth.
 4. Respiratory distress, apnoea or central cyanosis from any cause.
 5. Prolonged rupture of membranes (more than 24 hours) or maternal fever
 6. Major life-threatening congenital malformations
 7. Jaundice more than 15 mg% or requiring exchange transfusion
 8. Rhesus incompatibility
 9. Symptomatic hypoglycaemia
 10. Large for gestational age (Birth weight more than 4.0 kg) or infants of diabetic mothers.
 11. Convulsions
 12. Babies who require tube feeding or intravenous solutions
 13. Birth trauma (other than superficial injuries)
 14. Conditions requiring urgent surgical intervention (e.g. imperforate anus)
 15. Delivered by Caesaerian section or vacuum extraction.
 16. Born before arrival
 17. Septicaemia or meningitis
 18. Any other condition or illness requiring special care, as determined by a doctor in the paediatric unit.
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Results

Of the 392 cases, 196 were admitted to the special care nursery (the SCN group) and 196 were sent to their mothers in the postnatal wards (the PNW group).

Background variables: The PNW and the SCN groups were found to be statistically comparable with respect to the following possible confounding variables:

- indications for inclusion in the study.
- ethnic group of mothers

- age of mothers.
- educational level of mothers
- occupation of parents
- type and frequency of antenatal care
- type of delivery
- Apgar score at 5 minutes
- birth weight
- sex

The indications for inclusion into the study are listed in Table 2, This table shows that the two most common reasons for inclusion into the study were meconium staining (present in 40.3% of babies) and maternal sedation (present in 38.3% of babies).

Table 2
Indications for inclusion in the study

Indications for admissions	Group		Total	Chi square	P value
	SCN	PNW			
1. Forceps delivery	32 (16.3)	26 (13.3)	58 (14.8)	0.48	0.490
2. Breech delivery	34 (17.3)	30 (15.4)	64 (16.3)	0.15	0.698
3. Meconium staining without respiratory symptoms	86 (43.9)	72 (36.7)	158 (40.3)	1.79	0.181
4. Congenital malformation	2 (1.0)	2 (1.0)	4 (1.0)		1.000
5. Maternal sedation	69 (35.2)	81 (41.5)	150 (38.3)	1.40	0.236
6. Cord round neck	12 (6.1)	10 (5.1)	22 (5.6)	0.04	0.836
7. Maternal illness					
7a. VDRL positive	7 (3.6)	11 (5.6)	18 (4.6)	0.54	0.462
7b. HBsAg positive	2 (1.0)	2 (1.0)	4 (1.0)		1.000

Notes: Figures in brackets are the percentages of the total number of babies in each group with the indication.

A baby may have more than one indication for inclusion in the study and therefore the total number of times the inclusion criteria were satisfied do not equal the number of babies enrolled in the study.

*Fisher exact test is used in these categories.

Follow up: Out of the 392 babies, 316 (80.6%) were available for the follow-up interview. There

was no statistically significant difference between the SCN group and the PNW group in the proportion of babies who returned for the follow-up interview. Of the SCN babies, 78.6% come for the follow up interview compared to 82.7% of PNW babies. There was also no difference between the two groups with respect to the interval from birth to follow-up. The majority (88.6%) of babies came for follow-up between six to nine weeks after delivery.

Mortality and morbidity: There was one death. It occurred in a SCN group baby who was admitted back to the hospital on the 37th day of life for bronchopneumonia and septicemia. She died nine days later.

Morbidity was examined by observing for morbidity while the babies were in hospital during the immediate postnatal period and by asking for a history of morbidity during the follow-up interview.

Table 3 shows the morbidity which occurred in the babies before discharge from hospital. There was no difference between the SCN babies and the PNW babies in the development of morbidity during the period while they were still in hospital.

In the SCN group, 42 babies (27.3%) were reported by their mothers during the follow-up interview as having had some form of morbidity during the period from discharge to follow-up. The figure for the PNW group was 35 babies (21.6%). The difference was not significant ($P = 0.297$).

Table 3
Morbidity in babies before discharge from hospital

Group	Morbidity		Total
	Present	Absent	
SCN	1	195	196
PNW	4	192	196
Total	5	387	392

Notes: Fisher 2 tailed test P value = 0.372.

The baby in the SCN group had hypoglycaemia.

The babies in the PNW group had the following conditions:

- a. one asymptomatic hypoglycaemia
- b. one abdominal distension
- c. one "jitteriness"
- d. one meconium ileus, clinically diagnosed, no surgery done.

All recovered uneventfully.

Breastfeeding: While in hospital, a higher proportion of babies in the PNW group started breastfeeding as compared to the SCN group. (Table 4). The difference was statistically significant. Of those babies that started breastfeeding in hospital the babies in the PNW group were given their first breastfeed earlier compared to the babies in the SCN group. The difference was statistically significant (See Table 5).

Table 4
Initiation of Breastfeeding in Hospital by group

Group	Initiated Breastfeeding in Hospital		
	Yes	No	Total
SCN	64 (32.7)	132 (67.3)	196
PNW	181 (92.3)	15 (7.7)	196
Total	245 (62.5)	147 (37.5)	392

Notes: Figures in brackets are row percentages.
chi square = 146.5
P < 0.001

Table 5
Time of First Breastfeed in Hospital by Group

Group	Time of 1st breastfeed (hours)					Total	Median time from birth (hours)
	Less than 6	6-11	12-23	24-35	36 and above		
SCN	2 (3.1)	3 (4.7)	12 (18.8)	21 (32.8)	26 (40.6)	64	32.5
PNW	22 (12.2)	87 (48.1)	56 (30.9)	13 (7.2)	3 (1.7)	181	10.0
Total	24	90	68	34	29	245	12.0

Notes: 1. Figures in brackets are row percentages.
2. Time of first breastfeed was measured from time of birth.
chi square = 113.72
p < 0.001

At the time of discharge the proportion of babies on breastfeeding was higher in the PNW group compared to SCN group (Table 6). In the PNW group, 90.8% of the babies were breastfeeding at the time of discharge, 35.6% were fully breastfeeding and 55.2% on partial breastfeeding. In the SCN group, 31.3% of the babies were breastfeeding at the time of discharge, 3.6% were fully breastfeeding and 27.7% on partial breastfeeding. Partial breastfeeding means the baby was also bottle fed.

Table 6
Breastfeeding practice at time of discharge by group

Group	Breastfeeding practice			Total
	Full	Partial	Nil	
SCN	7 (3.6)	54 (27.7)	134 (68.7)	195
PNW	69 (35.6)	107 (55.2)	18 (9.3)	194
Total	76 (19.5)	161 (41.4)	152 (39.1)	389

Notes: Figures in brackets are row percentages
 Three cases were not included as their breastfeeding practices at time of discharge were unknown.
 chi square = 156.55
 p < 0.001

Of the 316 mothers who were available for the follow-up interview, 303 (95.9%) of them claimed to have ever breastfed their babies. In the SCN group 145 of 154 babies (94.2%) were ever breastfed. In the PNW group 158 of 162 babies (97.5%) were ever breastfed. The difference was not significant (P = 0.220).

The proportion of babies who were still breastfeeding at the time of follow-up was 71.7% (104 of 145 babies) for the SCN group and 68.2% (107 of 157 babies) for the PNW group. The difference was not significant (P = 0.582).

Discussion

This study has shown clearly that babies born with certain risk factors (as described in this study), can be safely cared for with their mothers in the postnatal wards, without increased mortality and morbidity.

The study has also shown that while in hospital more babies in the Postnatal Ward group were breastfed compared to the babies in the Special Care Nursery group. And that they started breastfeeding earlier. After discharge from hospital, the proportion of babies in the Special Care Nursery who were ever breastfed increased to the same level as that of the Postnatal Ward group. Admission to the Special Care Nursery resulted in delay in the initiation of breastfeeding. Therefore babies who previously would have been admitted to the SCN because of the presence of the specific risk factors as defined in this study should now be cared for in the postnatal wards with their mothers.

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 - ii) Universiti Malaya
 - iii) Seremban General Hospital
 - iv) Ipoh General Hospital