wjpmr, 2024, 10(7), 30-39

SJIF Impact Factor: 6.842

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

BLOOD TRANSFUSION IN THE SPECIAL CARE BABY UNIT OF RIVERS STATE UNIVERSITY TEACHING HOSPITAL, NIGERIA: PREVALENCE, INDICATIONS AND OUTCOME

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Article Received on 01/05/2024 **Article Revised on 21/05/2024** **Article Accepted on 11/06/2024**

ABSTRACT

Background: Blood transfusion is a common life-saving procedure among children especially the neonatal age. **Objective:** To determine the prevalence, pattern, indications and outcome of blood transfusion in neonates admitted in the special care baby unit of the Rivers State University Teaching Hospital. **Materials and Methods:** It was a prospective descriptive study of 179 neonates, carried out over 4 years from 27th January, 2020 – 26th January, 2024. **Results:** Of 1506 admitted neonates, 179 were transfused giving a blood transfusion prevalence rate of 11.9%. Males were mostly transfused with M: F ratio of 1.2:1. The least transfused neonates were of higher socio-economic class 49(27.4%). Most transfused neonates were preterm 144(80.4%), had birth weights between 1000-1499g 90(50.3%) and were first born 86(48.0%). Most were admitted within 24hours of delivery 143(79.9%), of singleton birth 134(74.9%) and delivered by Caesarean section 108(60.9%). Majority 119(66.5%) had pregnancy complications which were mostly hypertension 57(47.5%) and prolonged rupture of membranes 43(35.8%). Commonest morbidities among transfused neonates were prematurity, neonatal sepsis and neonatal jaundice while the commonest indication for transfusion was severe anaemia 173(98.8%). Most recipients received multiple transfusions 92(56.1%) with top up transfusions 175(97.8%) done mostly and by the second week of admission 53(29.6%). Most transfused neonates were discharged home 161(89.9%) with 8(4.5%) mortalities mainly from severe anaemia. **Conclusion:** The prevalence of blood transfusion was high, mainly among preterms with severe anaemia being the commonest indication. A high mortality of 4.5% therefore calls for policies and programmes targetted at reducing prematurity and blood transfusion rate in this age group.

KEYWORDS: Blood transfusion, Neonate, Outcome, Pattern, Prevalence.

INTRODUCTION

Blood transfusion refers to a common medical process where blood donated by one person is transfused into another person who needs the blood or blood products through an intravenous route. It is a procedure which has been used as early as the 17th century in the treatment of many ailments.[1] Following William Harvey's description of the circulation and properties of blood in 1628, many physicians attempted blood transfusions with some initial fatal results.[1] The first successfully documented blood transfusion was by Richard Lower in 1665 where he successfully bled a dog and transfused the dog's blood back into it.[1] Several years and attempts later, human to human transfusion was successfully carried out by James Blundell in 1818 on a woman who had intrapartum haemorrhage.[1],[2] During the second world war, blood transfusion was used on a large scale to treat wounded soldiers[1] and became well known as a life-saving procedure[1],[2] and has remained especially so in sick neonates.

Blood has several components such as red blood cells, white blood cells, plasma and platelets and any of these products may be replaced according to need in the neonate. Neonates have a small blood volume, are immature with an immature marrow activity hence there is a huge need for blood transfusion in this age group.[3]

Neonates (0 – 28 days old) are admitted into the neonatal unit or the Special Care Baby Unit (SCBU) for several reasons such as prematurity, low birth weight or normal weight with health conditions like hypoglycaemia, perinatal asphyxia, sepsis, respiratory distress, congenital anomalies and hyperbilirubinaemia etc. Critically ill neonates are especially prone to high transfusion needs[4] and blood transfusion has been known to be beneficial to these sick infants undergoing intensive care by

increasing the circulating haemoglobin, improving tissue oxygenation and reducing the cardiac output in order to maintain proper level of oxygenation.[5],[6]

The indications for blood transfusion in neonates can be physiological or pathological. These include blood loss during delivery and circumcision, iatrogenic from multiple blood collection for investigations, haemorrhagic disease of the new born, severe neonatal jaundice requiring exchange blood transfusion, sepsis, anaemia of prematurity and disseminated intravascular coagulopathy.

The prevalence of blood transfusion among children admitted in neonatal units varied in different reports within and outside Nigeria. Earlier reports documented prevalence rates of 27.9% in Sagamu,[7] 30.8% in Ibadan,[8] 20% in Port Harcourt[9] and 29.5% in Egypt[10] while a more recent report in Gombe,[11] Nigeria gave a 3.5% prevalence. Premature neonates have higher rates of blood transfusion with the most common indications being severe anaemia including anaemia of prematurity, neonatal jaundice and neonatal sepsis.[7-11]

The different blood products are usually transfused according to the specific needs of each neonate and these include whole blood, packed red blood cells, platelet concentrates, fresh frozen plasma and cryoprecipitates.

As a step towards improving the safety of blood transfusion and ensuring its' continuous benefit, it is important that data is generated. The present report is the first from the Rivers State University Teaching Hospital and was carried out to evaluate the prevalence, pattern, indications and outcome of blood transfusion among neonates admitted into the SCBU of the facility. The report from the study is expected to be helpful to health care providers and in policy making on blood transfusion in neonates.

MATERIALS AND METHODS

The Rivers State University Teaching Hospital (RSUTH) is a 375-bedded tertiary hospital located in the South South geographic zone of Nigeria, West Africa. The hospital caters for patients referred from different health care facilities (public and private) within and outside the State.

The SCBU is a level 3 tier unit which admits and manages neonates delivered within the facility or referred from outside. It has a capacity of 18 bed spaces in the inborn section for children born within the hospital, any of the government owned Primary Healthcare Centres & general hospitals and the 8 bed spaces in the out-born section which caters for newborns referred from health facilities outside from the above listed centres. This unit is overseen by 3 consultants, resident doctors (Senior & Junior residents), nurses and other support staff. The SCBU is a 24-hour unit in the Paediatrics department which consist of other units such as the children emergency room, childrens' ward and the children outpatient clinic.

It was a prospective descriptive study of 1506 neonates admitted into the Special Care Baby Unit of the RSUTH, Port Harcourt over a period of 4 years from 27th January, 2020 to 26th January, 2024.

A minimum sample size was obtained using the formula: [12] $n=z^2(pq)/e^2$
where n=minimum sample size
z= 1.96 at 95% confidence limit thus $z^2=3.841$
p=prevalence of blood transfusion, 11% was the prevalence of blood transfusion documented in a study in Makurdi,[20] Nigeria thus p=0.11
q=1-p (0.89)
Minimum sample size, n=150
Attrition = 19% of minimum sample size = 28.5 ~ 29
Thus, minimum sample size + Attrition = 179

All neonates 0-28 days old admitted into the SCBU in whom blood transfusion was recommended and parents/caregivers consented to the study were included in the study whereas neonates whose parents did not give consent and/or blood transfusion was not recommended for treatment were excluded from the study.

A research assistant was recruited for the purpose of this study and trained on the proper administration of the pre-tested and validated questionnaire before commencement of the study. The questionnaire was administered directly on a one-on-one interview to the Parents/Caregivers by the researcher and/or research assistant.

All neonates who satisfied the inclusion criteria were consecutively enrolled into the study and a pre-tested questionnaire was used to collect data. Enrolled neonates were monitored from admission until discharge or death. Data collated were patients' and parents' sociodemographic details, clinical details of the child, obstetric history of mother and blood transfusion characteristics. The sociodemographic details of the infants included their sex, date of birth, gestational age and age at admission into the SCBU. The clinical details included clinical diagnosis while obstetric details included antenatal care, pregnancy complications as well as mode of delivery and place of delivery. The sociodemograhic characteristics of the parents included age and socioeconomic status which was assessed using Oyedeji's classification.[13] The indication(s) for blood transfusion, type of blood, blood products transfused, frequency of transfusions, and outcome of infants were also documented in the proforma.

Informed consent was obtained from the parents/caregivers of the neonates after the study was explained to them in clear language they understood. Approval was obtained from the RSUTH Research Ethics Committee.

Data were entered into an Excel sheet thereafter analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Results were presented in frequencies, percentages, bar and pie charts while associations were established using Fishers Exact test and Chi Square test. Statistical significance was considered at *P* value ≤ .05.

RESULTS

Socio-demographic characteristics of the study population

There were 1,506 admissions during the period of study of which 179 neonates were transfused giving a blood transfusion prevalence rate of 11.9%. Males predominated 97(54.2%) with Male: Female ratio of 1.2:1. Majority of neonates presented at the SCBU within the 1st 24 hours of life 143(79.9%) and were of 1st birth order 86(48.0%). Most neonates transfused were of birth weights 1000-1499g 90(50.3%) and gestational age < 37 weeks 144(80.4%). Majority of the mothers of neonates transfused were of age group 30-39 years 104(58.1), mean age of 31.3±5.7 years and were of lower socioeconomic class 67(37.4%), Table I.

Table I: Socio-demographic characteristics of the study population.

Variables (%)	Frequency, n=179
Sex	
Male	97 (54.2)
Female	82 (45.8)
Age at presentation	
0-24hours	143 (79.9)
>1-7days	23 (12.8)
>7days	13 (7.3)
Birth order	
1st	86 (48.1)
2nd	41 (22.9)
3rd	28 (15.6)
4th	11 (6.1)
5th and above	13 (7.3)
Birth weight (g)	
<1000	7 (3.9)
1000-1499	90 (50.3)
1500-2499	47 (26.3)
2500-3999	27 (15.1)
≥4000	8 (4.4)
Gestational age (weeks)	
< 37	144 (80.4)
37-42	35 (19.6)
Mother's age (years)	
20-29	63 (35.2)
30-39	104 (58.1)
≥40	12 (6.7)
Socio-economic status	
Upper class	49 (27.4)
Middle class	63 (35.2)
Lower class	67 (37.4)

Maternal Pregnancy and Birth history

Majority of the mothers had singleton babies 134(74.9%) and attended antenatal care 164(91.6%) mainly in Primary Health Care centres 75(45.7%). Most were inborn babies 132(73.7%) delivered via Caesarean section 108(60.3%) mainly in RSUTH 138(77.1%) with pregnancy complications 119(66.5%), Table II.

Table II: Maternal Pregnancy and Birth history.

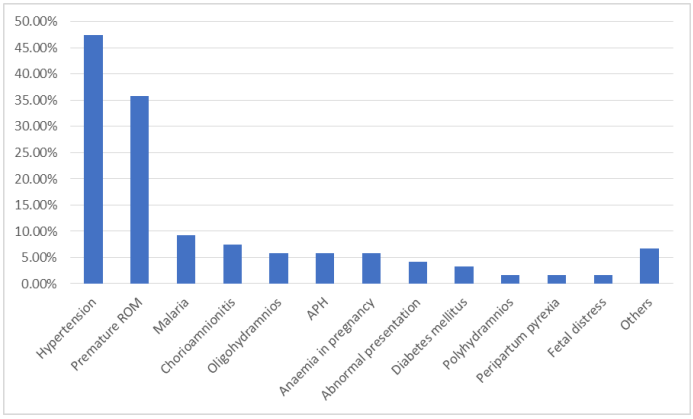
Variables (%)	Frequency, n=179
Pregnancy outcome	
Singleton	134 (74.9)
Multiple	45 (25.1)
Antenatal care (ANC) attendance	

Yes	164 (91.6)
No	15 (8.4)
Place of ANC, n=164	
RSUTH	69 (42.1)
PHC	75 (45.7)
Private hospital	20 (12.2)
Place of delivery	
Inborn	132 (73.7)
Outborn	47 (26.3)
Mode of delivery	
SVD	70 (39.1)
CS	108 (60.3)
Instrumental	1 (0.6)
Place of delivery	
RSUTH	138 (77.1)
Private hospital	14 (7.8)
TBA	9 (5.0)
Others	18 (10.1)
Presence of pregnancy complications	
Yes	119 (66.5)
No	60 (33.5)

RSUTH=Rivers State University Teaching Hospital, PHC=Primary Health Care, SVD=Spontaneous vaginal delivery, CS=Caesarean section, TBA-Traditional birth attendant

Maternal pregnancy complications

The commonest pregnancy complications in mothers of neonates transfused was hypertension 57(47.5%) followed by premature rupture of membranes 43(35.8%), malaria in pregnancy 11(9.2%) and chorioamnionitis 9(7.5%), Figure 1.

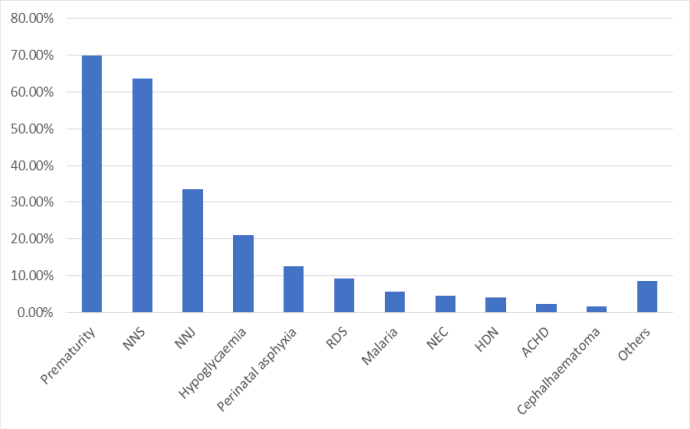


ROM = Rupture of membranes, Antepartum haemorrhage, APH = Antepartum haemorrhage

Figure 1: Maternal pregnancy complications.

Morbidity pattern of neonates transfused

The commonest morbidity among neonates transfused was prematurity 123(69.9%) followed by neonatal sepsis 112(63.6%) and neonatal jaundice 59(33.5%), Figure 2.



NNS = Neonatal sepsis, NNJ = Neonatal jaundice, RDS = Respiratory distress syndrome, NEC = Necrotizing enterocolitis, HDN = Haemorrhagic disease of the newborn, ACHD = Acyanotic congenital heart disease

Figure 2: Morbidity pattern of neonates transfused.

Pattern and Outcome of blood transfusion

There was a total of 375 transfusions giving an average blood transfusion rate of 2.1 per neonate. Multiple blood transfusions predominated 92(56.1%) and most transfusions took place by 8-14 days of age 53(29.6%) with most undergoing top up transfusion 175(97.8%). Sedimented cells (in place of packed red blood cells) were majorly transfused 166(92.7%). Majority of neonates transfused had duration of hospital stay above 40 days 70(39.1%) and were discharged home 161(89.9%) while 8(4.5%) died. The causes of death were severe anaemia 3(37.5%), necrotizing enterocolitis 2(25.0%), neonatal sepsis 2(25.0%) and Heart failure 1(12.5%), Table III.

Table III: Pattern and outcome of blood Transfusion and Outcome.

Variables (%)	Frequency, n=179
Number of transfusions, n=164	
Single	72 (43.9)
Multiple	92 (56.1)
Age at transfusion (days)	
0-7	36 (20.2)
8-14	53 (29.6)
15-21	45 (25.1)
>21	45 (25.1)
Type of transfusion	
Top up transfusion	175 (97.8)
Exchange blood transfusion	4 (2.2)
Type of blood transfused	
Sedimented cells	166 (92.7)
Whole blood	13 (7.3)
Duration of hospital stay (days)	
1-10	28 (15.6)
11-20	27 (15.1)
21-30	29 (16.2)
31-40	25 (14.0)
>40	70 (39.1)
Outcome	
Discharged	161 (89.9)
DAMA	10 (5.6)
Died	8 (4.5)

DAMA = Discharged against medical advice

Indications of blood transfusion

Severe anaemia was the commonest indication for top up transfusion 173(98.8%) while severe neonatal jaundice/kernicterus was the commonest indication for exchange blood transfusion, Table IV.

Table IV: Indications of blood transfusion.

Variables n(%)	Frequency,
Indications of top up transfusion, n=175	
Severe anaemia	173 (98.8)
Haemorrhagic disease of the newborn	1 (0.6)
Sepsis with DIC	1 (0.6)
Indications of exchange blood transfusion, n=4	
Severe neonatal jaundice/kernicterus	3 (75.0)
Severe sepsis with DIC	1 (25.0)

DIC = Disseminated intravascular coagulation

Association of Pre and Post transfusion packed cell volume (PCV)

There was a significant difference between the mean pre-transfusion PCV and mean post-transfusion PCV (*P* value < 0.001), Table V.

Table V: Association of Pre and Post transfusion PCV.

Variables	Pearson Correlation coefficient	*P* value
Mean Pre-transfusion PCV (%) 25.6 ± 4.5 Mean Post-transfusion PCV (%) 34.5 ± 6.4	0.429	**< 0.001***

PCV-Packed cell volume, *=Statistically significant

Association of type of blood transfusion and gestational age

There was significant association between gestational age and type of transfusion (*P* value =0.001), Table VI.

Table VI: Association of type of blood Transfusion and Gestational age.

Variable	Type of transfusion		Test of significance
	Top up, n (%)	EBT, n (%)	*P* value
Gestational age (weeks)			
< 37	144 (82.3)	0	**0.001***
≥ 37	31 (17.7)	4 (100.0)	

EBT-Exchange blood transfusion, *=Statistically significant

Association between number of Transfusions and Socio-demographic characteristics

Gestational age, socio-economic status and duration of hospital stay were significantly associated with the number of neonatal transfusions (*P* value = 0.021, 0.035 and <0.001 respectively), Table VII.

Table VII: Association between number of Transfusions and Socio-demographic characteristics.

Variables	Number of transfusions		Test of significance
	Single, n (%)	Multiple, n (%)	*P* value
Sex			
Male	42 (58.3)	49 (53.3)	0.531
Female	30 (41.7)	43 (46.7)	
Age at presentation			
0-24 hours	58 (80.6)	77 (83.7)	
1-7 days	8 (11.1)	8 (8.7)	0.867
>7 days	6 (8.3)	7 (7.6)	
Birth order			
1st	39 (54.2)	38 (41.3)	
2nd	14 (19.4)	25 (27.2)	
3rd	11 (15.3)	14 (15.2)	0.095
4th	6 (8.3)	4 (4.3)	
5th and above	2 (2.8)	11 (12.0)	

Birth weight (g)			
<1000	2 (2.8)	5 (5.4)	
1000-1499	30 (41.7)	56 (60.9)	
1500-2499	24 (33.3)	19 (20.7)	0.051
2500-3999	12 (16.7)	11 (12.0)	
≥4000	4 (5.6)	1 (1.1)	
Gestational age (weeks)			
<37	54 (75.0)	82 (89.1)	**0.021***
37-42	18 (25.0)	10 (10.9)	
Mother's age (years)			
20-29	31 (43.1)	25 (27.2)	
30-39	36 (50.0)	62 (67.4)	0.079
≥40	5 (6.9)	5 (5.4)	
Socio-economic status			
Upper class	25 (34.7)	19 (20.7)	
Middle class	26 (36.1)	29 (31.5)	**0.035***
Lower class	21 (29.2)	44 (47.8)	
Duration of hospital stay (days)			
1-10	14 (19.4)	8(8.7)	
11-20	17 (23.6)	7 (7.6)	
21-30	14 (19.4)	13 (14.1)	**<0.001***
31-40	13 (18.1)	10 (10.9)	
>40	14 (19.4)	54 (58.7)	

DISCUSSION

The prevalence rate of blood transfusion in the neonatal unit of the Rivers State University Teaching Hospital of 11.9% was similar to the 11.7% and 11.1% reported in Ogbomosho[14] and Markurdi,[12] Nigeria respectively. It was however higher than the 3.5% reported in a retrospective study in Gombe,[11] Nigeria but lower than the 16.2%, 19.98% and 29.5% in Bagdad, Iraq[15] Tehran, Iran[16] and Egypt[10] respectively as well as 27.9%, 30.8%, 34.9% and 55.6% in other parts of Nigeria.[7],[8],[17] These varying prevalence rates could be attributable to difference in geographic locations with varying morbidity patterns as well as the varying standard operating procedures in these units due to lack of standardization of the cut-off value for severe anaemia requiring blood transfusion in the new born. The high prevalence of blood transfusion in most neonatal units is not surprising as this procedure which is life-saving is indicated in many conditions in the neonatal period due to either physiological or pathological causes.[17] There is reduced marrow activity in the new born period necessitating the huge need for blood transfusion in this age group as well as repeated blood sampling for monitoring especially in hospitalised neonates.[3]

Males predominated in the present study with a Male: Female ratio of 1.2:1. This observation was also the case in other studies in and outside Nigeria.[7],[12],[14],[15],[17] This could be because male neonates have been observed to be more predisposed to infections when compared to their female counterparts. Male neonates tend to have more severe disease with poorer prognosis in addition.[18] They are more predisposed to sepsis, respiratory morbidities and perinatal brain injuries amongst others.[18] Understandably, male hormones inhibit T and B lymphocyte maturation thus are biologically weaker.[19],[20] It is noteworthy that Ogunlesi and Ogunfowora[7] documented that a significantly higher proportion of blood transfusion was recorded in male babies than their female counterparts (*P* value < 0.001)

Most neonates transfused with blood were preterms with GA < 37 weeks (80.4%). This was similarly documented in other parts of Nigeria[8],[12],[14] Iran,[9] Egypt[10] and the United States.[21] This trend was foreseeable as anaemia is commoner in premature neonates as compared with term neonates. This is expected as preterm babies have lower haemoglobin due to inadequate transfer of iron from the mothers to the foetus in addition to poor postnatal production of endogenous erythropoietin. Blood transfusion is even more in developing countries in this age group as recombinant human erythropoietin is not routinely used due to its' unavailability and when available because of its' extremely high cost.[7],[8] In addition, their predisposition to infection as well as the need for repeated blood sampling/venepunctures are other causes of anaemia and blood transfusion. In contrast, a 6 months descriptive cross-sectional study in Bagdad, Iraq[15] reported a predominance of blood transfusion among term neonates with GA 37 – 41 weeks. The short duration of the study could account for this difference as the present study was carried out over a 4 years period.

About half (50.3%) of the neonates who received blood transfusion in the present study were of birth weights 1000 – 1499g differing from studies in Ogbomosho,[14] Nigeria and Bagdad, Iraq[15] where low birth weight babies with birth weights 1500 – 2500g received blood transfusion most whereas in Makurdi,[12] Nigeria close to half of the neonates (44.4%) with normal weight were mostly transfused. The finding in the present study is

consistent with the fact that the need for blood transfusion is inversely proportional to the birth weight and gestational age of the child, reason being their smaller circulatory blood volumes.[22] In addition, better survival rates of the very LBW babies in the present study centre could account for this difference.

In the present study, an average of 2.1 blood transfusions per child was carried out. Similarly, Borna et al[16] in Tehran, Iran reported 3.65 transfusions per child while Aboladje et al[23] in Delta State, Nigeria reported 1-4 blood transfusion sessions per child with mean of 1.2 ± 0.6. These thus highlights the enormous need of blood transfusion in the neonatal unit.

Multiple blood transfusions were carried out mostly in the present study as also observed in Sagamu,[7] south west Nigeria. Contrarily, single transfusions predominated in Delta state, [23] south south Nigeria and in Tehran, Iran.[16] This difference could be accounted for by difference in the morbidity patterns and their severity in the various geographic regions. Multiple blood transfusion was common in the present study and other studies in Nigeria probably because the use of recombinant erythropoietin is not common as observed in other developing countries unlike in the developed countries.[24] This is because of its' unavailability and in areas where it is available, it is very expensive and thus unaffordable. Interestingly, the present study showed that babies delivered at GA < 37 weeks were significantly associated with multiple blood transfusions (*P* value 0.021) corroborating findings also by Ogunlesi and Ogunfowora.[7] Frequency of blood transfusion can however be minimized by policies that will reduce the prevalence of prematurity as well as making available and affordable erythropoietin in developing countries including Nigeria, in the management of anaemia in neonates especially, preterm babies.

Majority (97.8%) of blood transfusions were top up transfusions while a few were exchange blood transfusions. Top up transfusions also predominated in Gombe[11] north east, Zaria[17] north west and Delta state,[23] south south Nigeria. In Sagamu[7] south west Nigeria however, exchange blood transfusion (EBT) was mostly carried out as was the case in Makurdi[12] north central Nigeria. This difference could be due to varying morbidity pattern as well as differing standard operating procedures in the various health facilities. In the present study, the number of transfusions done was significantly associated with gestational age, socioeconomic status and duration of hospital stay. This was consistent with findings by Borna et al[16] in Tehran, Iran.

Babies with GA < 37 weeks were more likely to have top-up transfusions (*P* value 0.001) in the present study. Interestingly, anaemia of prematurity which is peculiar to this gestational age is attributable to inadequate maternofetal iron transfer in addition to the poor production of endogenous erythropoietin during the postnatal period.[22] Also, repeated venepunctures and blood testing exacerbates anaemia in this group of neonates because of their small blood volume. These babies therefore, may require repeated small volume red blood cell transfusions (top-up) in order to correct or replace these losses. It is pertinent to note that > 90% of extreme LBW and about 60% of very LBW babies would receive at least 1 red blood cell transfusion during their stay in the neonatal intensive care unit.[25]

Most neonates in the present study received sedimented cells (in place of packed RBCs) as also recorded in Makurdi[12] north central Nigeria. Packed cells were reported as the commonest component of blood transfused in Egypt,[10] fresh frozen plasma in Tehran, Iran[16] and whole blood in Gombe,[11] north east Nigeria. It was of particular interest that other blood types like packed cells, cryoprecipitate, fresh frozen plasma was not transfused in the present study due to their unavailability thus could account for the differences observed. This practice is unsatisfactory as component therapy which is the standard of care as is the case in the developed world must be imbibed therefore governments should provide facilities to make available these various blood components so as to improve survival rates in the neonatal period.

In the present study, severe anaemia was the commonest indication for top up transfusion while severe hyperbilirubinaemia was the commonest indication for EBT. This was also documented in other studies in Nigeria[7],[11],[12],[14],[17],[23] whereas in Ibadan[8] south west Nigeria prematurity, neonatal sepsis and neonatal jaundice were the commonest indications of blood transfusion while in Egypt,[10] anaemia of prematurity, neonatal sepsis and neonatal jaundice were documented. Neonatal jaundice being the commonest indication for EBT in the present study is not surprising as EBT is required to remove excess unconjugated bilirubin from the blood in order to prevent brain damage in these babies which is irreversible. Interestingly, the EBT rate in the present study was very low as observed in the developed world.[26] This could be attributed to a high index of suspicion, early diagnosis and the availability and use of intensive LED phototherapy machines with high irradiance in the neonatal unit. The varying indications for the types of blood transfusion also depend on the facility's standard operating procedure.

More than 3/4th neonates (89.9%) who had blood transfusion were discharged home as documented in other studies.[11],[12] The mortality rate among neonates who had blood transfusion was 4.5% in the present study which was higher than the 3.2% recorded in Markurdi,[12] north central Nigeria but much lower than the 22.9% documented in Gombe,[11] north east Nigeria. Ogunlesi and Ogunfowora[7] in Sagamu, south west Nigeria in their 12 months retrospective study documented that 34.1% of babies who died had blood transfusion as compared with 25.7% of babies discharged. Also, Diab et

al[10] in Egypt reported that neonates who had blood transfusion had significantly higher mortality compared with those who were not transfused. This difference in outcome could be due to the varying geographic locations and morbidity patterns as well as the ready availability of the specific blood components needed for transfusion. This therefore calls to attention the significance of blood transfusion in neonates when the need arises. It is pertinent to note that in the present study there was a significant rise in the packed cell volume between the pre-transfusion and the post-transfusion values (*P* value < 0.001). It is pertinent to note that the importance of blood transfusion services in every centre where new born babies are cared for cannot be over emphasized in addition to the availability of various blood components as well as erythropoietin to reduce neonatal morbidity and mortality.

CONCLUSION

The prevalence of blood transfusion in the neonatal unit of the Rivers State University Teaching Hospital was high being 11.9%, commoner in males and preterms. Multiple blood transfusions predominated, mainly top-up transfusions with commonest indications being severe anaemia and hyperbilirubinaemia. Majority of the neonates were discharged home with a mortality rate of 4.5%. Thus, policies and programmes that will reduce the delivery of preterm babies as well as the availability of recombinant human erythropoietin will go a long way to reduce blood transfusions in neonatal units and in addition reduce neonatal morbidity and mortality.

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