The use of blood transfusions in the obstetric unit of an academic hospital in South Africa

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Transfusions with blood products form an essential part of obstetric practice. A retrospective record review of all mothers (26) who received blood transfusions over a period of one month in May 2010 was performed at the Charlotte Maxeke Johannesburg Academic Hospital. Descriptive analysis was performed. Blood transfusion was commonly observed in women with late antenatal booking, human immunodeficiency virus positivity, multiparity, anaemia at first visit, and normal vaginal delivery. Iron supplementation usage was very poor in this group of women. The most common indication for transfusion was postpartum haemorrhage. These associated factors should be used to identify pregnant women at risk, so that timely and adequate treatment of anaemia may decrease the need for transfusion. Adequate care should also be given in the management of the third stage of labour, to prevent avoidable morbidities (postpartum haemorrhage, retained products of conception, and vaginal lacerations), leading to excessive blood loss and the need for transfusions.

Introduction

Blood transfusions play an integral and essential role in obstetric practice. Haemorrhage during pregnancy accounts for 34% of maternal deaths in Africa, while obstetric haemorrhage (antepartum and postpartum) was the cause of 12.4% of maternal deaths in South Africa between 2005-2007, of which postpartum haemorrhage (PPH) was most common (9.7%). The majority (70-80%) of the haemorrhages were avoidable.

In another South African study, haemorrhage accounted for 32%, and 57%, of cases of severe acute maternal morbidity, and maternal mortality, respectively.

The South African National Blood service (SANBS) reported the percentage of blood issued for obstetric and gynaecological cases in 2010 to be 26%, the second highest, following medical cases [cancer, human immunodeficiency (HIV) and anaemia] at 27%.

The mode of delivery might have some influence on blood transfusion. In a study carried out in the United Kingdom among 202 pregnant women, the rate of transfusion was 3.8%. The most common mode of delivery among the women who required transfusion was assisted vaginal deliveries (35%), followed by emergency Caesarean section deliveries (28%), normal vaginal deliveries (25%), and finally elective Caesarean section deliveries (12%). PPH was the cause of the majority (96%) of transfusions, while four per cent were due to antepartum haemorrhage.

A Nigerian study that was conducted among 463 women who underwent Caesarean section deliveries reported the rate of transfusion to be 25%, which was related strongly to indications for Caesarean section, preoperative anaemia, and blood loss during Caesarean section.

Reported studies on blood transfusion in obstetrics units in South Africa are very rare.

Method

A retrospective record review was conducted of all women who delivered in May 2010, and received blood products transfusion, either during pregnancy or labour, or in the postpartum period, at the Charlotte Maxeke Johannesburg Academic Hospital. All information on antenatal, intrapartum and postpartum blood transfusion, was analysed, using descriptive statistics such as mean [standard deviation (SD)] for normally distributed data, and median [interquartile range (IQR)] was calculated for data that were not normally distributed.

The human research ethics committee of the University of the Witwatersrand approved the study.

Results

The total number of deliveries in May 2010 was 689, and 26 of the women received a blood transfusion. Therefore, the rate of blood transfusion was four per cent of the total deliveries. The mean age and parity of the women who received blood transfusions were 27.6 years (SD + 6.5), and two (SD + 1) respectively. Seven (27%) of the women were primigravidae, and 19 (73%) multiparous (P1-P4).

Five (19%) women had never attended any antenatal clinic, and for those who had booked, the mean gestational age (GA) at booking was 30.3 (SD ± 5.2) weeks. Seven (27%) and 14 (54%)
women had booked in the second and third trimester respectively.

All the women (26, 100%) were Rhesus positive. Of the 22 women whose syphilis (rapid plasma reagin) results were documented, all (100%) were negative. Of the 24 women whose HIV status was documented, 13 (54%) were positive, and 11 (46%) were negative.

All five women whose cluster of differentiation 4 (CD4) count was documented, had CD4 counts of less than 350 x 10^6/litre, the cut-off for the initiation of highly active antiretroviral therapy (HAART) in South Africa. The mean CD4 count was 203 (SD + 114) x 10^6/litre. Two (40%) and three (60%) women were receiving HAART, and dual therapy, respectively.

Of the 18 (86%) women who had anaemia [Haemoglobin (Hb) < 11 gm/dl] at the first antenatal clinic visit, 14 (78%) were multiparous, 11 (61%) were HIV positive, and four (22%) were primigravidae. Of the eight women whose Hb was repeated at the last visit, the mean interval between the first and last visit was 5.7 (SD + 3.35) weeks (see Table I).

<table>
<thead>
<tr>
<th>Documented</th>
<th>Hb at first visit (n, %)</th>
<th>Hb at repeat visit (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia present</td>
<td>18 (66)</td>
<td>8 (100)</td>
</tr>
<tr>
<td>Hb (mean + SD)</td>
<td>9.2 (SD + 2.1) g/dl</td>
<td>9 (SD + 1.4) g/dl</td>
</tr>
</tbody>
</table>

Of the 18 women who were anaemic at the first antenatal clinic visit, five (28%) received iron supplement antenatally.

Nineteen (73%) women had antenatal complications such as preterm labour (8; 42%), postdates (6; 32%), pre-eclampsia, (3; 16%), intrauterine growth retardation (1; 5%), and pneumonia (1; 5%).

Of the 24 women whose gestational age (GA) at delivery was documented, mean GA was 37.7 (SD ± 3.6) weeks.

The indications of transfusions were PPH (21, 80%) due to atonic uterus, bleeding due to retained products of conception (RPOC) (2; 8%), and extensive vaginal lacerations-related bleeding (2; 8%). One transfusion (4%) was carried out due to intrapartum abruptio placenta.

Twenty-five (96%) women required transfusion during the postpartum period, and one (4%) received a transfusion during the intrapartum period.

Twenty-four (92%) women received packed red cells, one (4%) woman received combined packed cells and platelets, and one (4%) woman received combined packed cells, platelets, and fresh frozen plasma. A total of 20 women, whose number of units was documented, received a total of 41 units of packed red cells, making it on average two units per woman. A total of 54 units of packed red cells were issued for the obstetric unit from the blood bank during the study period.

Twenty-five (96%) women had documented anaemia (Hb < 11g/dl) just prior to transfusion. The mean Hb prior to transfusion was 7.6 (SD + 1.4) g/dl.

Of the 26 women, 16 (61%) had NVDs, nine (35%) had Caesarean section deliveries, and one (4%) had an assisted vaginal delivery.

Six (23%) women, who required surgical interventions, underwent evacuation of the uterus (2; 33%), repair of vaginal lacerations (2; 33%), subtotal hysterectomy (1; 17%), and exploratory laparotomy (1; 17%).

All 26 (100%) babies were born alive, with median Apgar scores at one, five, and 10 minutes, of nine (IQR 7-9), 10 (IQR 9-10), and 10 (IQR 9-10) respectively. The mean birthweight of the baby that was documented in 24 women was 2 823 g (SD ± 698 g). Ten (42%), eight (33%), and six (25%) babies had weights of normal (> 2.5-3.5 kg), preterm (< 2.5 kg), and more than 3.5 kg, respectively.

Three (12%) women required ICU admission and none died.

**Discussion**

Multiparity, late antenatal clinic booking, HIV/acquired immune deficiency syndrome (AIDS), NVD, and normal birthweight of the baby, were common among women who required transfusion. Very late booking (54% in the third trimester), and very poor iron supplementation (28%), might have prevented the Hb level from rising to optimum prior to delivery. Poor CD4 count testing coverage is a concern, along with poor documentation of all records.

The proportion of NVDs (61%), and normal birthweight (42%) of the baby, was higher in women who underwent transfusions. Very late booking (54% in the third trimester), and very poor iron supplementation (28%), might have prevented the Hb level from rising to optimum prior to delivery. Poor CD4 count testing coverage is a concern, along with poor documentation of all records.

Of the 26 babies, 16 (61%) had normal birthweights (2.5-3.5 kg), nine (35%) had preterm births (< 2.5 kg), and one (4%) had a birthweight greater than 3.5 kg.

Three (12%) women required ICU admission and none died.

**Conclusion**

Testing the Hb level twice, and providing iron supplementation to all anaemic women during pregnancy, should be made mandatory. Multiparous women, women with HIV/AIDS, and those who made their antenatal clinic bookings late, should be given regular iron supplementation. All women of reproductive age should be provided with adequate information about the
benefits of early booking in pregnancy. Additionally, HIV testing and CD4 count should be determined in all pregnant women to manage HIV-related maternal and foetal morbidity.

Particular emphasis should be placed on the management of the third stage of labour, to prevent avoidable morbidities, such as PPH, RPOC, and vaginal lacerations, which require transfusions.

References


Obesity and its outcome among South African pregnant adolescents

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Obesity is an epidemic that affects all age groups, including adolescents. Obesity studies on pregnant adolescents are few in number. This pilot study was conducted to determine the obesity prevalence and complications among pregnant South African adolescents. A retrospective review of 54 pregnant adolescents was carried out over a two-month period at the Charlotte Maxeke Johannesburg Academic Hospital. Adolescents were divided into different body mass index categories, and the data were compared. Descriptive statistics (mean ± standard deviation (SD), and median with interquartile range (IQR) numbers and percentages) and inferential statistics [analysis of variance (ANOVA) and unpaired t-test] were used. The human ethics research committee of the University of the Witwatersrand approved the study.

Results

From a total of 767 deliveries, 54 (7%) were adolescent, during the two-month period. There were 16 (30%) normal, 24 (44%) overweight, 11 (20%) obese, and three (6%) morbidly obese adolescents.

Introduction

Adult obesity during pregnancy has been studied extensively. However, studies on obese adolescents and their pregnancy outcomes are rare. In a large retrospective study, six per cent of the deliveries were adolescent, and 28% were overweight or obese. Increased body mass index (BMI) was associated with higher parity, pregnancy-induced hypertension, gestational diabetes mellitus, induction of labour, and Caesarean sections.

In another large retrospective study among 10,322 deliveries, 712 (7%) deliveries were adolescent, of which 458 adolescents were eligible for the study. The study reported that only gestational diabetes mellitus and Caesarean sections increased among the overweight (106, 23%) and obese (78, 17%) adolescents. Additionally, BMI was shown to increase in winter.
The mean BMI was 28.1 ± 5.9. Mean BMI was compared in summer (February) and spring (September), and it was significantly (unpaired t-test, p-value = 0.002) increased in spring (30 ± 7.5), compared to summer (26 ± 3.2).

Fifty-one (94%) adolescents were African, and ethnicity was not different (ANOVA, p-value = 0.80) among different groups. The median age and the mean booking gestational age were 18 (IQR 13-19) years, and 26 (SD ± 5.6) weeks respectively.

Twenty-five (46%) adolescents were multigravidas. There were two (12%), 16 (67%), five (45%) and two (67%) multigravidas in the normal, overweight, obese, and morbidly obese groups, respectively, and parity was significantly higher in the obese and morbidly obese groups (see Table I).

There was no gestational diabetes mellitus. Antenatal complications were compared (see Table II).

Mean gestational age at delivery (normal 38 ± 2.8 weeks, overweight 39 ± 2.2 weeks, obese 39 ± 1.7 weeks, and morbidly obese 39 ± 3.4 weeks) was not different (ANOVA, p-value = 0.69) among the categories.

Mode of delivery [normal: 10 (63%) vaginal, five (31%) Caesarean sections, one (6%) assisted delivery; overweight: 12 (50%) vaginal, 12 (50%) Caesarean sections; obese: six (55%) vaginal, five (45%) Caesarean sections; and morbidly obese: two (67%) vaginal, one (33%) Caesarean section]; was not different (ANOVA, p-value = 0.92) among the groups.

Mean birthweight of baby (normal: 3 134 g ± 724.17; overweight: 3 174 g ± 506.78; obese: 3 195 g ± 416.51; and morbidly obese 3 216 g ± 710.51) was not different (ANOVA, p-value = 0.99) among the groups.

Discussion

The results show both similarities and differences, when compared to other studies. The prevalence of overweight (44%) and obesity (20%) in this study was higher than that recorded in previous studies.1,5 In this study, the finding of morbid obesity in a large number (6%) of adolescents during pregnancy was a new observation, as it has not been reported in previous studies.4,5

It was a novel idea to compare BMI in pregnant adolescents during two different seasons. This has never been reported previously. The increased weight gain recorded in February was similar to the increased weight gain in September among non-pregnant adult women.6

Morbidly obese adolescents booked at an antenatal clinic much later in their pregnancies. This finding was different to that of a previous study5 in which the mean antenatal booking gestational age was 15 weeks for all BMI groups. Although there were no significant differences in antenatal complications in the groups, the rate of post-date deliveries, pregnancy-induced hypertension, preterm labour and induction of labour, was higher in the morbidly obese group. The previous study showed a significantly higher rate of all such complications in the obese group.4

The gestational age at delivery was linearly increased in the overweight, obese, and morbidly obese groups in this study, whereas previous studies4,5 reported a significantly higher gestational age at delivery in the obese group. Overweight and obese adolescents had more Caesarean section deliveries, similar to the findings of previous studies.4,5

Birthweight increased with increasing BMI, a similar finding to

Table I: Demographic profile of study participants

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
<th>Morbidly obese</th>
<th>p-value (ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean ± SD)</td>
<td>16 ± 1.7</td>
<td>19 (15-19)</td>
<td>18 ± 1.4</td>
<td>16 ± 3.2</td>
<td>0.02</td>
</tr>
<tr>
<td>Parity (median + IQR)</td>
<td>0 (0-1)</td>
<td>1 (0-2)</td>
<td>0 (0-4)</td>
<td>1 (0-3)</td>
<td>0.02</td>
</tr>
<tr>
<td>Booking GA (weeks) (mean ± SD)</td>
<td>25 ± 1.7</td>
<td>28 ± 5.8</td>
<td>25 ± 4.5</td>
<td>31 ± 5.1</td>
<td>0.19</td>
</tr>
</tbody>
</table>

* a = analysis of variance, b = standard deviation, c = median value (interquartile range) is presented as data were not normally distributed, d = significant results, e = interquartile range, f = gestational age

Table II: Antenatal complications

<table>
<thead>
<tr>
<th></th>
<th>Normal* n (%)</th>
<th>Overweight* n (%)</th>
<th>Obese* n (%)</th>
<th>Morbidly obese* n (%)</th>
<th>P-value (ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postdates</td>
<td>4 (27)</td>
<td>7 (29)</td>
<td>3 (27)</td>
<td>2 (67)</td>
<td>0.20</td>
</tr>
<tr>
<td>Pregnancy-induced hypertension</td>
<td>1 (6)</td>
<td>3 (13)</td>
<td>1 (9)</td>
<td>1 (33)</td>
<td>N/A*</td>
</tr>
<tr>
<td>Preterm labour</td>
<td>4 (25)</td>
<td>4 (17)</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>0.59</td>
</tr>
<tr>
<td>Induction of labour</td>
<td>2 (13)</td>
<td>2 (8)</td>
<td>2 (18)</td>
<td>1 (33)</td>
<td>0.62</td>
</tr>
</tbody>
</table>

a = n = 16, b = n = 24, c = n = 11, d = n = 3, e = not applicable
that reported in previous studies. The small sample size of this study might have prevented some results from obtaining statistical significance. This is a limitation. Nevertheless, the study reflected a similar global pattern of high prevalence of obesity, and its associated complications in pregnancy among South African adolescents. A larger study that focuses on obesity, and particularly on obesity in pregnant adolescents in South Africa, is necessary.

Declarations

The authors declare no conflict of interest. They have not received any funding from any authority to conduct this study.

References


Risk factors for cardiovascular disease in workers at a district hospital

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Certain risk factors play an important role in a person’s chances of developing heart disease. The more risk factors a person has, the greater the likelihood of developing heart disease. Proactively addressing the modifiable risk factors reduces the chances for a person to develop a cardiovascular disease or die from its complications. The author wished to establish the prevalence of the risk factors for cardiovascular diseases in workers at a district hospital. From September 2007 to the end of October 2007, workers were invited, on a voluntary basis, to know their ‘numbers’ (measured levels) as far as their risk for cardiac disease was concerned. A data capture sheet was compiled including the ‘numbers’ to know, as recommended by The Heart and Stroke Foundation South Africa (HSFSA): blood pressure, weight, blood sugar, height, and age and cholesterol level. Due to hospital cost constraints, cholesterol was not done. Data were collected for 108 individuals who volunteered to take part in the study. The hospital had, at the time of the project, 473 full time workers in all categories.

Introduction

Cardiovascular disease is the leading cause of mortality in almost every developing country in the world. Approximately 14 million individuals died of cardiovascular disease in 1990, and this is projected to rise to about 25 million by 2020. In a large part, this increase can be explained by major ongoing socio-demographic changes in developing countries, and associated effects on the numbers of individuals at risk and the levels of cardiovascular risk factors.

Certain factors (risk factors) play an important role in a person’s chances of developing cardiovascular disease. The more risk factors a person has, the greater the likelihood of developing the disease. In addition to death, cardiovascular disease also causes many serious non-fatal events and in 1990 they were major causes of disability-adjusted life years (DALYs) – a measure of the total burden of disease caused by premature deaths and nonfatal events combined.

The author wished to establish the prevalence of the cardiovascular disease risk factors in the workers at a district hospital. The findings would assist the Occupational Health Unit of the hospital in recommending healthy lifestyle habits to the workers.

Methods

From September 2007 to end of October 2007, workers at Middelburg Hospital were invited, on a voluntary basis, to know their ‘numbers’ as far as their risk for cardiac disease was concerned. A data capture sheet was compiled including the ‘numbers’ to know, as recommended by The Heart and Stroke Foundation South Africa (HSFSA): blood pressure, weight, blood sugar, height, and age and cholesterol level. Due to hospital cost constraints, cholesterol was not done. Data were collected for 108 individuals who volunteered to take part in the study. The hospital had, at the time of the project, 473 full time workers in all categories.

Results

The following findings are worth reporting:
- Age distribution: among the participants 50.9% were in the active life adult age group (above 40 years). This group...
may be at risk of cardiovascular disease as increasing age is an established risk factor.

- Abdominal circumference: The abdominal circumference of the majority of the female participants (55.9%) was abnormal. Abdominal obesity is an independent risk factor for cardiovascular disease. The effect of abdominal obesity is strongest in the smoker and the unfit.

- Blood glucose: Of the participants, 6% had a random glucose of between 7.8 to 11.0 mmol/l and 3% had a random glucose of more than 11.1 mmol/l. Blood glucose level is a risk marker for cardiovascular disease among apparently healthy individuals without diabetes. Increasing levels of blood sugar put the patient at risk of developing cardiovascular disease.

- Blood pressure: Of the participants, 12% had grade 1 hypertension, 14% had grade 2 hypertension and 3% had severe hypertension. An association between hypertension and cardiovascular disease is well established. Hypertension appears to contribute to risk for cardiovascular disease even in the absence of other risk factors.

- Exercise: Of the participants, 88% did not engage in any form of physical exercise, therefore placing them at the risk of heart disease by not benefiting from the positive effect of exercise on the cardiovascular system. Lack of physical activity in the general population is a public health problem and is recognised as an independent risk factor for the development of coronary disease.

- Smoking: Of the participants, 7.4% were active smokers, and the numbers were equally divided among female and male participants. Active cigarette smoking is one of the most important modifiable risk factors for cardiovascular disease.

**Conclusion**

The survey clearly established the existence of the risk factors for cardiovascular disease in the workers at the district hospital. Some of them, who already had a condition that may complicate into a cardiovascular disease, were not aware due to the lack of signs or symptoms. Addressing dyslipidemia (an important risk factor) will go a long way in preventing cardiovascular disease; however, due to cost constraints, lipid profiles were not done in the workers.

The employers are encouraged to recommend regular checks for the employees in their care; at least one annual (periodic) health assessment should be done and the report thereof kept in the employee’s file. The availability of an occupational health clinic at the place of work would assist those employees who do not have access to private medical practitioners.

The findings of this survey cannot be generalised due the small sample size and the participants were all volunteers.

**References**


**Erratum**

The order of the authors of the following article was published incorrectly in The Southern African Journal of Epidemiology and Infection: Pansinusitis in an HIV-infected patient due to Scedosporium apiospermum (Pseudallescheria boydii complex). South Afr J Epidemiol Infect. 2011;26(2):88-89. The authors should have been listed as follows: C Kenyon, D Lubbe, B Khoury, H Vismer, R Hoffman and M Mendelson.