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RESEARCH ARTICLE

COMPARISON OF NEONATAL OUTCOME ASSOCIATED WITH ELECTIVE CAESAREAN SECTION VERSUS PLANNED VAGINAL DELIVERY IN A LOW-RISK OBSTETRIC POPULATION

[1,] *Abdelmoneim, E.M. Kheir, [2]Reem, B.A. Ali and [3]Mohammed, A.M. Ahmed

[1]Department of Paediatrics and Child Health, Faculty of Medicine, University of Khartoum and Soba University Hospital, P.O. Box 102, Khartoum, Sudan
[2]Department of obstetrics and gynaecology, University of Medical Sciences and Technology, Khartoum, Sudan
[3]Department of Paediatrics, Soba University Hospital, Khartoum, Sudan

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ABSTRACT

Background: Caesarean section rates are rising with possible negative impact on mother and baby.
Methods: This was a prospective, case control study that was conducted in Omdurman maternity hospital during the period July 2013 to January 2014. 400 babies were included in the study, 200 were outcome of normal spontaneous vaginal delivery and the other 200 were outcome of elective caesarian section. Data was collected using a specifically designed questionnaire containing maternal and neonatal data, Neonatal outcome was compared between the two groups.. Data was analyzed by SPSS program, Chi square test was used to study the correlation between neonatal outcome and type of delivery.
Results: The results showed that the majority of the women in the caesarean section group (87%) had regular antenatal care. There were 4(2%) babies with low birth weight (LBW) in the vaginal delivery group compared to no baby in the other group. There were 7(3.5%) babies in the vaginal delivery group with Apgar score less than 7 at 5 minutes and no baby in the caesarian section group had low Apgar score with significant association between low Apgar score and type of delivery (P=0.001).Elective caesarean delivery increased the rate of transfer to the neonatal intensive care unit and the risk for transient tachypnea of the newborn with significant association between transient tachypnea of the newborn and type of delivery (P= 0.04).
Conclusion: There is an association between mode of delivery and neonatal outcome. Therefore, we emphasize the importance of limiting elective caesarean deliveries to cases with clear indications and proven benefit for the mother and baby.

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INTRODUCTION

A frequent dilemma for obstetricians is to determine the best mode of delivery in order to optimize pregnancy outcome for both mother and baby.Controversy exists as to whether the increase of intervention such as operative vaginal delivery (VD) and caesarean delivery (CD) improve obstetric outcomes (Shamsa *et al.,* 2013). There is a serious concern regarding the dramatically rising rates of CD worldwide (Villar *et al.,* 2007).In US, rate was 32.8% in 2010 (Hamilton *et al.,* 2011).The rate in Canada was 25% to 30% in 2003, making CD the most common surgical procedure in Canada (Christilaw, 2006).The estimate for CD rates in East Asia also shows that it is well above 15% (Stanton and Holtz, 2006). Sudan is no exception and maternal and child health survey in1995 reported a hospital based CD rate of 20.4%(Khawaja *et al.,* 2009).Unnecessary CD may be associated with increased maternal and perinatal morbidity (Lumbiganon *et al.,* 2010). Some studies clearly demonstrate the benefits of CD because of urinary and faecal incontinence after VD (Heit *et al.,* 2001), breech presentation at term (Hannah *et al.,* 2000) and neonatal outcome (Schindl *et al.,* 2003). While other studies favour VD because of longer recovery time and operative complications (Bergholt *et al.,* 2003) and respiratory problems of the newborn (Zanardo *et al.,* 2004). There is no previous study done in Sudan addressing the issue of neonatal outcome in relation to mode of delivery in uncomplicated pregnancy. Sudan being a low income country, it is of policy concern to have high rate of caesarian sections because of the medical effects and the high costs of undergoing operative deliveries.

Corresponding author: Abdelmoneim, E.M. Kheir,
Department of Paediatrics and Child Health, Faculty of Medicine, University of Khartoum and Soba University Hospital, P.O. Box 102, Khartoum, Sudan.

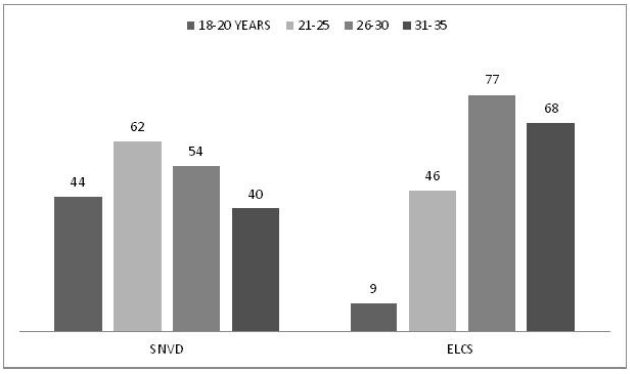
Therefore, there is a need to address the factors that increase the risk of operative deliveries in this part of the world in order to reduce the practice. This main objectives of this research were to compare the influence of the mode of delivery in uncomplicated pregnancy on selected neonatal morbidities and outcomes like respiratory complications, birth asphyxia, birth weightand admission to the neonatal intensive care unit.

MATERIALS AND METHODS

This was a prospective, comparative, case control study that was conducted in Omdurman maternity hospital which is the largest maternity hospital in Sudan during the period July 2013 to January 2014. 400 babies were included in the study, 200 were outcome of normal spontaneous VD and the other 200 were outcome of elective CD, only babies who were term and a product of singleton, uncomplicated pregnancy were included in the study. The exclusion criteria included those babies who were outcome of complicated pregnancy with maternal illness of any kind, preterm delivery, twins' delivery, emergency CD, assisted delivery and those women who refused to participate in the study. Sampling technique was simple random method. Data was collected using a specifically designed questionnaire filled out by the researchers, maternal data included age of the mother, occupation, level of education, social class , duration of marriage, antenatal care, gestational age , parity, blood group, type of delivery and indication for CD. Neonatal data included gender, gestational age, birth weight, Apgar score at 1 and 5 minutes, need for neonatal unit admission and any respiratory morbidity like transient tachypnea of the newborn (TTN). Neonatal outcome was compared between the two groups, low birth weight is defined as weight less than 2.5 Kg, birth asphyxia if Apgar score is less than 7 at 5minutes, TTN based on clinical and radiological features in addition to admission to the neonatal intensive care unit. Data was analyzed by statistical package for social sciences (SPSS) version 21, frequency analysis for back ground variables was conducted. Chi square test was used to study the correlation between neonatal outcome and type of delivery. P value was set at 0.05 level of significance. Ethical approval for conducting this research was granted by the ethical committees of Sudan medical specialization board and Omdurman maternity hospital. Prior informed consent was obtained from individual subjects with full explanation of the study.

RESULTS

During the study period a total of 400 babies who fulfilled the criteria were included in the study. They were further divided into two groups on the basis of the mode of delivery. Regarding the age distribution of the two groups, about one third of the women in the VD group were lying between 21-25 years while 77(38.5%) of the women in the CD group were lying between 26-30 years Figure (1). Most of the women in the two groups (80%) were housewives and about 5-10% were employee in different kinds of jobs. Regarding the level of education in the two groups, those who were university graduates were 63(31.5%) in the VD group and 70(35%) in the elective CD group. Primary school education in the VD group was 66(33%) and 34(17%) in the CD group. It is interesting that illiterate mothers were 5 (2.5%) in the VD group and 12(6%) in the CD group. Most of the women in the VD group (77%) had low socioeconomic status while 110 (55%) in the CD group had average socioeconomic status. Our data showed that the majority of the women in the CD group (87%) had regular antenatal care, while 136(68%) in the VD group had regular antenatal care, those who didn't have any antennal care were 4(2%) in the VD with significant association between type of delivery and antenatal care (P=0.000). Almost all of the CD were performed at 38 weeks gestation while 139(69.5%) of the VD group delivered at 40 weeks and 61(30.5%) delivered between 37-39 weeks. Table (1) shows the different indications for CD.

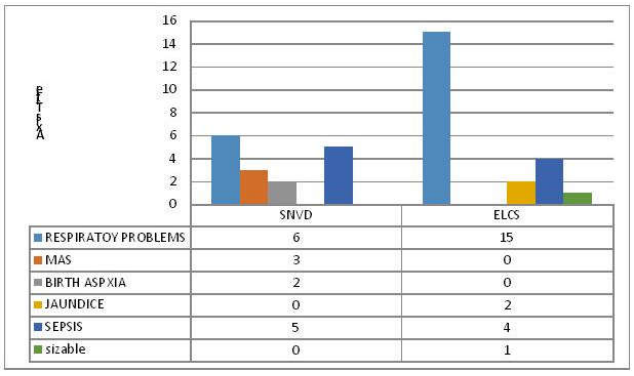


SNVD : Spontaneous normal vaginal delivery ELCS : elective lower segment caesarean section

Figure 1. Maternal age and type delivery

SNVD : Spontaneous normal vaginal delivery ELCS : elective lower segment caesarean section

Figure 2. Type of delivery and birth weight



SNVD : Spontaneous normal vaginal delivery ELCS : elective lower segment caesarean section

MAS : Meconium aspiration syndrome

Figure 3. Type of delivery and neonatal morbidity

Table 1. Indications for caesarian delivery

Cephalopelvic disproportion	19	9.5%
Primigravidabreech	15	7.5%
Previous scar	151	75.5.%
Failed vaginal birth after caesarian section	10	5%
Primigravida and myomectomy	1	0.5%
Previous scar plus breech	1	0.5%
Grand-multipara	1	0.5%
Induced pregnancy	1	0.5%
Secondary infertility	1	0.5%

Regarding neonatal data, our study revealed that the male to female ratio was 1.19:1 in the VD group and 0.96:1 in the elective CD group. The study showed that there were 4(2%) babies with low birth weight(LBW) in the VD group and no baby with LBW in the CD group, those who were > 3.5 Kg in the VD group were 12(6%) and 8(8%) in the CD group Figure (2). Regarding Apgar score, there were 7(3.5%) babies in the VD group with Apgar score less than 7 at 5 minutes and no baby in the CD group had low Apgar score with significant association between low Apgar score and type of delivery(P=0.001). Neonates who needed admission to the neonatal unit from the VD group were 16(8%), 6(3%) had respiratory problems, 3(1.5%) had meconium aspiration syndrome. In the CD group, 22(11%) babies needed admission, most of the babies here (15) had breathing problems Figure(3). 11(5.5%) babies in the CD group developed TTN while 3 (1.5%) in the VD group developed TTN with significant association between TTN and type of delivery (P= 0.04).

DISCUSSION

Worldwide, there is a trend for rise in CD rate and this phenomenon hasn't contributed to an improved pregnancy outcome (Oumachigui,2006). The present study is an attempt to compare the neonatal outcome associated with elective CD versus planned VD in a low-risk obstetric population. Our study indicated that the majority of the women in the CD group (87%) had regular antenatal care, which is in line with other similar studies that showed mothers who had regular antenatal care had higher number of CD (Unnikrishnan *et al.* 2010, D'Orsi *et al.,* 2006), this could be due to complications in previous or current pregnancy that necessitated frequent antenatal visits which in turn resulted in caesarean section. Most of the women in the VD group had low socioeconomic status while more than half of the women in the CD group had average socioeconomic status. Kudisha *et al.* reported a similar finding that only a minority of women from low socioeconomic background would go for CD (Kudisha *et al.,* 2010). This signifies the fact that only women from moderate or high socioeconomic status can afford this more expensive mode of delivery. Most of the women in the CD group lied between 26-35 years, which is contrary to the results of a previous study, which indicated that there is an association between advanced maternal age and CD (Dulitzki *et al.,* 1998). The increased rate of caesarean delivery with advanced maternal age is due to age related diseases like hypertension, diabetes mellitus and infertility. Our data indicated significant association between low Apgar score and type of delivery where 7(3.5%) babies in the VD group had low Apgar score compared with no baby in the CD group, this is contrary to the finding in Norway which showed no significant difference in the risk for Apgar score <7 and <4 after 5 minutes in the two groups (Kolås *et al.,* 2006).This difference is probably due to better monitoring and advanced obstetric care. The present study indicated that more babies from the CD group needed admission to the neonatal intensive care unit than the other group which is in line with the Norwegian study (Kolås *et al.,* 2006), this would certainly increase the workload and cost in neonatal units. Our data indicated that there were 4 (2%) babies with LBW in the VD group and no baby with LBW in the CD group, this is similar to a study done in Thailand which showed that babies born by elective CD had a greater weight (Yeekian *et al.,* 2013).This is probably due to regular antenatal care visits and confirmation of dates by ultrasound. The present study indicated that 11(5.5%) babies in the elective section group developed TTN while 3 (1.5%) in the vaginal delivery group developed TTN with significant association between TTN and type of delivery, which is consistent with previous studies that have reported increased neonatal respiratory distress after CD (Richardson *et al.* 2005, Zanardo *et al.* 2007, Fogelson *et al.,* 2005). Labour and delivery enhance neonatal lung adaptation by inducing a surge of catecholamine sin the fetus, which is important for postnatal lung adaptation. Infants born vaginally have higher catecholamine concentration at birth than infants bornby CD (Wang *et al.,* 1999).

Conclusion

CD rates are rising with possible negative impact on mother and baby. Elective CD increases the rate of transfer to the neonatal intensive care unit and the risk for respiratory complications whereas VD has significant association with LBW and low Apgar score. Therefore, we emphasize the importance of limiting elective CD to cases with clear indications and proven benefit for the mother and baby.

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