

# Perinatal Outcome of the Second Twin

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Received: March 05, 2014; Accepted: December 12, 2014

**Aims:** The purpose of this study was to determine the perinatal outcome of the second twin compared to the first one.

**Methods:** This is a hospital based comparative study of 60 pregnant women with twin pregnancy at Paropakar Maternity and Women's Hospital, Kathmandu from 14 January 2013 to 13 April 2013. Apgar score and admission to neonatal intensive care unit of the first and the second twins were studied in relation to the gestational age, chorionicity, mode of delivery, inter-delivery interval and birth weight. Mc Nemars test was used with 0.05 as the level of significance.

**Results:** Among 60 sets of twins, Apgar score of the second twin was found to be lower than the first one ( $p=0.02$ ) in general and in preterm gestation ( $p=0.049$ ), dichorionic diamniotic chorionicity ( $p=0.012$ ), vaginal delivery ( $p<0.001$ ), inter-delivery interval of  $<30$  minutes ( $p=0.007$ ) and birth weight discordance of  $<30\%$  ( $p=0.014$ ). Admission to neonatal intensive care unit was not significant ( $p=0.5$ ).

**Conclusions:** Second twin had low Apgar score and the neonatal admission rate was similar for both twins.

**Keywords:** Apgar score; chorionicity; twin pregnancy.

## INTRODUCTION

Twin pregnancies have been found to vary in different parts of the world. The highest incidence is in Nigeria (49/1000) and the lowest in China and Japan (2/1000) while Europe and USA have the intermediate incidence (5.9-8.9/1000).<sup>1</sup> The incidence of twin pregnancy has been on the rising trend, 65% since 1980.<sup>2,3</sup> There were 194 (1%) twin pregnancies out of 19,247 total deliveries a year prior to the study at Paropakar Maternity and Women's Hospital in Kathmandu.<sup>4</sup>

This study was warranted due to the increased incidence of foetal malpresentation, preterm labour, birth weight discordance, placental abnormalities and operative deliveries in twin pregnancy.<sup>1</sup> This study was an attempt to find out the outcome of the second twin in terms of the Apgar score at 5 minutes and the need for neonatal intensive care unit admission of the second twin in relation to the gestational age, chorionicity, mode of delivery, delivery interval between the first and the second twin and the birth weight.

## CORRESPONDENCE

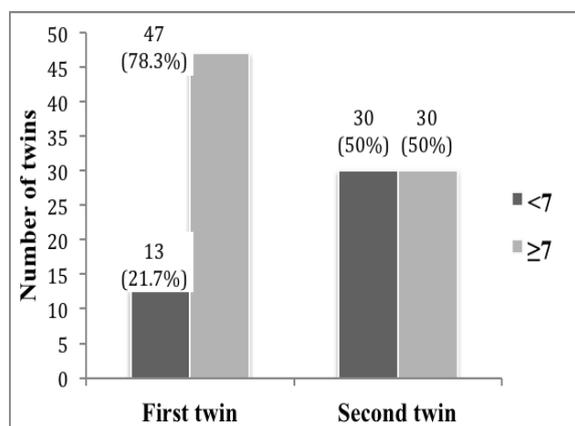
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## METHODS

A comparative study of 60 twin pregnancies with non-probability sampling technique was done at Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu, for three months from 14 January 2013 to 13 April 2013. All pregnant women with twin pregnancy of more than 28 weeks of gestation were included in the study. Intrauterine death of one foetus and gross congenital anomalies were excluded. Approval was taken from the institutional review committee of the hospital and written informed consent from the patient was taken. The data were entered in SPSS spread sheet (version 16). Mc Nemars test was used and p-value was considered significant at  $<0.05$ .

## RESULTS

Total 60 sets of twin deliveries were analyzed. Most of the mothers (88.3%,  $n=53$ ) were in between the age of 20-34 years and 41.6% ( $n=25$ ) of them were nullipara followed by 35% ( $n=21$ ) being primipara. Almost equal frequency of the mothers (51.7% and 48.3% respectively) had the delivery at the gestational age of  $<37$  weeks and  $\geq 37$  weeks. Majority of the pregnancy (58.3%,  $n=35$ ) were dichorionic diamniotic (DCDA). Almost equal frequencies of the deliveries of both twins (45% and 50% respectively) were done vaginally and by caesarean section. Majority (91.7%,  $n=55$ ) of the cases had inter-delivery interval of  $<30$  minutes.

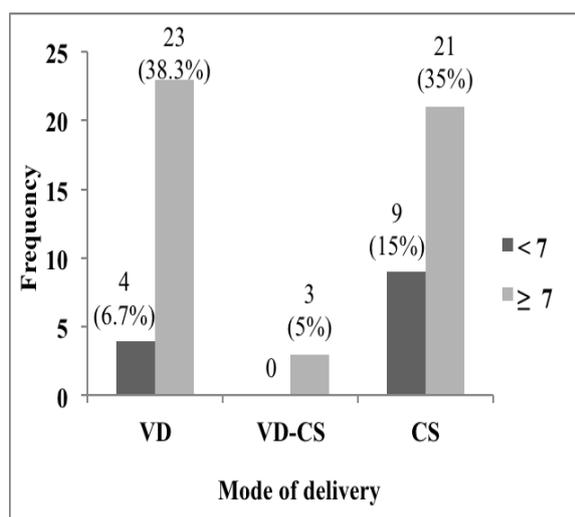


**Figure 1. Apgar score of the first and the second twin.**

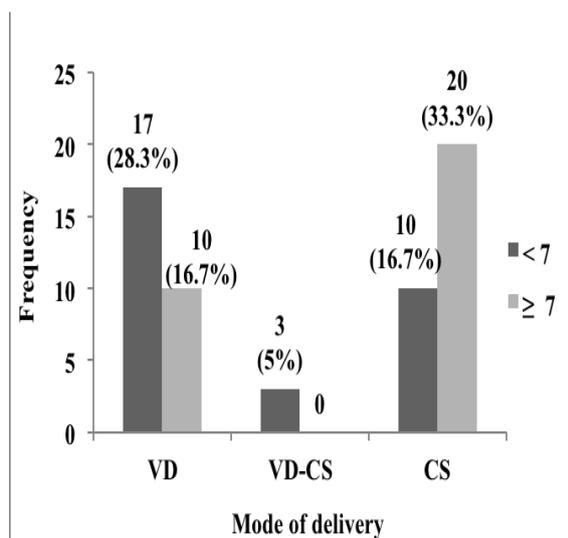
Fifty percent (n=30) of the second twins had Apgar score of <7 and only 21.7% (n=13) of the first twin had low Apgar score which was statistically significant (p=0.006) as shown in Figure 1, but only 30% (n=18) of the second twins and 25% (n=15) of the first twins required admission to neonatal intensive care unit, and was not statistically significant (p=0.508).

Twenty-five percent (n=15) preterm and 25% (n=15) term second twins, and 10% (n=6) preterm and 11.7% (n=7) term first twins had Apgar score less than 7.

Vaginal delivery shows significant effect (p <0.001) for low Apgar score (Figure 2A and 2B), but the neonatal intensive care unit admission rate was not different (p=0.68).



**Figure 2A. Apgar score of the first twin in relation to the mode of delivery.**



**Figure 2B. Apgar score of the second twin in relation to the mode of delivery.**

Most of the second twins (91.7%, n=55) were delivered within 30 minutes. Apgar score of <7 in the second twin was found to be statistically significant (p=0.007) with respect to the inter-delivery interval of < 30 minutes but there was no difference in the neonatal admission rate (p=0.219).

There were 75% (n=90) low birth weight babies and only 34.4% (n=31) of them required admissions for neonatal care but, out of 25% (n=30) average weight babies, only two (one first twin and one second twin) were admitted. There was no difference in low Apgar score in either group (p=0.50).

Among the twins with birth weight discordance of <30%, equal number of babies were seen in two Apgar score group in the second twins and 71.7% (43 vs. 13) of the first twins had good Apgar score of ≥ 7 (p = 0.014) compared to the second twins. There was no statistical difference in neonatal intensive care unit admission rate (p=1).

Perinatal mortality was 28.3% (n=17) with 5% (n=3) stillbirths (second twins only) and 23.3% (n=14) early neonatal deaths (10 second twins and four first twins). Perinatal mortality was more on the second twins (21.7%, n=13). The causes of early neonatal death for the first twins were sepsis (n=2), prematurity (n=1) and respiratory distress syndrome (n=1). In the second twins, the causes were sepsis (n=4), perinatal asphyxia (n=4), prematurity (n=1) and respiratory distress syndrome (n=1).

## DISCUSSION

Since the past three decades there has been tremendous increase in multiple gestation, which has not only created a public health concern but also a medical dilemma.<sup>2,3</sup> Compared to the singleton pregnancies, in twin pregnancy there is much higher occurrence of almost all obstetric complications with much worse perinatal outcomes due to increasing morbidity and mortality. Even among the first born and the second born twin, the second born twin is in much disadvantage. This study was conducted to evaluate the difference in the perinatal outcome between them.

In this study, low Apgar score in the second twins was comparable to the similar study done by Hartley and Hitti,<sup>5</sup> Prins,<sup>6</sup> and Chang et al.<sup>7</sup> This could be due to reduced placental circulation after the delivery of the first twin, breech deliveries, and potentially greater susceptibility of second twin to hypoxia. Higher rate perinatal mortality rate in second twin (16.7% vs. 6.7%) could be due to higher susceptibility of the second born twin to hypoxia, sepsis and respiratory distress. Similar higher perinatal mortality in second born twin was seen in other studies.<sup>8-11</sup>

There was only slight increase in neonatal admission for the second twins (30% vs. 25%). The major cause for admission in neonatal unit was prematurity for both the first twins (n=13) and the second twins (n=12). This was followed by birth asphyxia (four second twins and one first twin). Similar finding was observed in the study done by Hanumaiah et al<sup>8</sup> in India where very low birth weight was the leading cause for neonatal admission followed by respiratory distress and birth asphyxia.

The preterm second twins had lower Apgar scores (p=0.049), which could be due to the reason that preterm babies are more easily affected by asphyxia than their term counterparts. Similar to this study, Dera et al<sup>12</sup> and Armson et al<sup>13</sup> also observed lower Apgar scores in premature neonates which they have attributed to the lower gestational age and low birth weight.

The second twin babies born preterm encountered higher rates of neonatal morbidities and mortalities compared to the twins born at term. Similar findings were seen in a study done by Crowther,<sup>11</sup> Smith et al<sup>14</sup> and Hack et al.<sup>15</sup>

Dizygosity was more common in this study than monozygosity which was similar to the observations

made by Lewi and Deprest,<sup>16</sup> and Katz et al.<sup>17</sup> In cases of monochorionicity, more of the second twins had Apgar score <7 than the first twin (MCDA: 6 vs. 4; MCMA: 6 vs. 3) similar to the study done by Shrim et al.<sup>18</sup>

Perinatal mortality rate in this study was similar to the study done by Hack et al,<sup>15</sup> Wieczorek and Krasomski,<sup>19</sup> Victoria et al,<sup>20</sup> Sperling et al,<sup>21</sup> and Oldenburg et al.<sup>22</sup>

Vaginal delivery puts more stress on foetus resulting in lower Apgar score for the second twin (p <0.001). This could be explained by the fact that during the vaginal delivery, the second born twin is under stress of labour for a longer time than the first-born twin. Armson et al<sup>13</sup> and Yang et al<sup>23</sup> also observed low Apgar score for second twin who delivered vaginally. Similar to the study by Ginsberg et al,<sup>24</sup> the Apgar score of the second twin was lower than the first twin in all the three cases of vaginal delivery of first twin and caesarean section for the second twin (one had zero score and two had 4-6). There was comparable low-Apgar score at 5 minutes in the twins who were delivered by caesarean section (23.3% of the second twins and 20% of the first twins). Similar to this study, Bisschop et al<sup>25</sup> did not observe any difference in the neonatal outcome of either twin at caesarean section.

Even when the second twin was delivered within half an hour of the birth of the first twin, the second twin had more chance of having Apgar score < 7 than the first twin (p=0.007). This can be explained by the fact that long inter-delivery interval in between the twins can lead to the foetal hypoxia due to diminished placental perfusion.<sup>26</sup> There were less number of cases (n=5) with  $\geq 30$  minutes of inter-delivery interval to compare the Apgar scores.

Three first twins and two second twins with  $\geq 30$  minutes inter delivery interval had early neonatal deaths. With regard to stillbirths two second twins and one first twin had inter-delivery interval of <30 minutes. Similar to this finding, in study done by Ezechi et al,<sup>27</sup> neonatal death were higher than still birth rates in retained second twin (47.3 % vs. 41.9%).

There was no correlation between neonatal admission and inter-delivery interval. In a study done by Healy and Gaddipati,<sup>28</sup> there was not increased neonatal intensive admission even when the inter-delivery interval increased to >30 minutes.

Birth weight discordance between the twin pairs

was calculated (in percentage) using the formula “birth weight of larger twin minus birth weight of the smaller twin and divided by the birth weight of the larger twin and finally multiplied by hundred”. When the birth weight discordance was considered, in <30% sub group, the second twins had more chance of having Apgar score of <7 ( $p=0.014$ ). There was less number of cases ( $n=8$ ) with  $\geq 30\%$  birth weight discordance to compare the Apgar scores. Sujuki et al<sup>29</sup> found that the smaller twin (usually the second twin<sup>1,3</sup>) among the discordant twin pair had higher risk of lesser Apgar score at birth and umbilical artery pH of <7.1.

All stillbirths and 71% of early neonatal deaths had birth weight discordance of <30 % among perinatal deaths and similar result was reported by Garite et al.<sup>30</sup> It can be explained by the fact that the birth weight discordance is not an independent factor leading to the adverse perinatal outcome in twin pregnancy.<sup>29</sup> Some studies have shown birth weight discordance to be associated with increased mortality in the smaller second twin because of the twin to twin transfusion, which was not seen in this study.<sup>31,32</sup>

In those women who had twins with birth weight discordance of < 30%, there was not increased chance of the second twin being admitted to neonatal intensive care unit. In the study done by Mazhar and Kanwal,<sup>33</sup> higher percentage (16 % and 12.5%) of twins needed admission only to the intermediate care baby unit in birth weight discordant pair than concordant pair (7.8% and 7%).

Overall in this study, major differences between the first twin and the second twin could not be proven statistically. The much favorable outcome for both

the first and the second born twin in this study may be due to the small group of patients, appropriate and timely antenatal diagnosis of twins, careful intra-partum monitoring of both fetuses; and majority of the women included in the study had uncomplicated ante-partum as well as intra-partum period and half of them had undergone caesarean section.

Although the second twin is more prone to birth asphyxia as a result of the prolong inter-delivery interval, umbilical cord prolapse, early placental separation, impaired placental perfusion, abnormal presentation and increased operative vaginal delivery which leads to much higher perinatal mortality in the second twin, many of these factors were not seen in this study which may be due to the increased operative mode of delivery.

## CONCLUSIONS

The Apgar score of the second twins were lower than the first ones but the perinatal mortality among them were only slightly different. Neonatal intensive care unit admission rates were similar. The second born twins were likely to have lesser Apgar score (<7) in preterm, dichorionic-diamniotic placentation, vaginal delivery, inter-delivery interval of <30 minutes and birth weight discordance of <30%. Further study with a bigger sample is required to describe more on the foeto-maternal parameters of twins.

## DISCLOSURE

The authors report no conflicts of interest in this work.

No violation of human rights and safety.

Funding: Nil

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