International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 7, July 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.7.2024.80

ORIGINAL RESEARCH

Effect of nuchal cord on mode of delivery and apgar score of newborn

[1]Gulzar Ahmed, [2]Daman deep Kaur, [3]Urvashi Sharma, [4]Parikh Rana

[1]Pg scholar, [2,3]Senior Resident, [4]Associate Professor, Department of Obs Gyne, SMGS, GMC, Jammu, Jammu and Kashmir, India

Corresponding author
Urvashi Sharma
Senior Resident, Department of Obs Gyne, SMGS, GMC, Jammu, Jammu and Kashmir, India

Received Date: 26 May, 2024 Accepted Date: 05 July, 2024

ABSTRACT

Introduction-A nuchal cord (NC) refers to the umbilical cord being wrapped around the neck of the fetus at birth. Nuchal cord (NC) is identified as a significant factor contributing to fetal distress and perinatal mortality. The present study was done to assess the effect of nuchal cord on mode of delivery and APGAR score of newborn. **Material and methods-** The present prospective study was conducted at department of obstetrics and gynaecology of SMGS Hospital among 100 pregnant women with single pregnancy during the study period of one year. Association between mode of delivery and Apgar score of baby with nuchal cord was studied. Results were analyzed using SPSS version 25.0. **Results** –In the present study, nuchal cord was present in 14 patients named as group P and was absent in 86 patients named as group A . Among them 11 patients had one loop, 2 patients had two loops and 1patient had three loops. The existence of nuchal cord did not have an impact on the mode of delivery ($p = 0.915$). The statistical analysis did not find a significant association between an Apgar score below 7 at 1 and 5 minutes and admission to the Neonatal Intensive Care Unit (NICU) ($P>0.05$). **Conclusion** – Nuchal cord (NC) is frequently observed during childbirth. The current study indicates that there is no significant association between NC and mode of delivery as well as apgar score of new born.

Keywords- Apgar Score, Mode Of Delivery, Newborn, Nuchal Cord, Outcome, Pregnancy

INTRODUCTION

A nuchal cord is a condition when the umbilical cord is wrapped completely around the fetal neck, forming a 360º loop.[1]It is a prevalent problem associated with the umbilical cord. Pregnancy complicated by a nuchal cord is a condition that poses a significant risk, especially during the process of labor and delivery. Nuchal cords impede the regular circulation of blood, gasses, and nutrients from the mother to the fetus, resulting in significant harm such as birth asphyxia (hypoxic ischemic encephalopathy or HIE) and cerebral palsy.[2] Non-communicable diseases (NCs) are observed in 13-30% of births, and their occurrence becomes more common as the pregnancy progresses. The frequency of NCs starts at 5.8% at 20 weeks of gestation and rises to 29% at 42 weeks. The occurrence of nuchal cord increased as the pregnancy progressed, from 12% between 24 to 26 weeks to 37% at full term. [3,4]

The occurrence of a nuchal cord has been observed to be linked with several parameters in the mother, fetus, umbilical cord, placenta, and labor, and is related with less favorable outcomes for the fetus. However, most of the available studies on this topic are either case reports or short series. The effect of a nuchal cord on the initiation of labor is still uncertain, and there is a lack of research especially examining this particular group of women. In a recent retrospective case control research conducted by Rhoades et al., it was discovered that a nuchal cord is an independent risk factor for the induction of labor.[5] Color Doppler imaging has recently been incorporated as a tool to assist with sonographic diagnosis. In general, the accuracy of diagnosis is greater when using color Doppler imaging, which can be very beneficial when dealing with ruptured membranes.[6] A study conducted by Morarji et al. found that a tight nuchal cord can lead to hypovolemic shock and anemia by partially compressing the cord.[7] The perspectives regarding the presence of a tight nuchal cord during childbirth range from being a normal discovery to being a potential cause of a life-threatening issue.[8]

The management techniques surrounding the delivery of these babies have sparked controversy, with some obstetricians favoring elective cesarean section and others opting for vaginal delivery. When identified prenatally using ultrasound, obstetricians are more inclined to deliver these babies via cesarean section. Moreover, the concern about potential problems in newborns supports the use of surgical procedures.

DOI: 10.69605/ijlbpr_13.7.2024.80

Hence the present study was done to assess the effect of nuchal cord on mode of delivery and APGAR score of newborn.

MATERIAL AND METHODS

The present prospective study was conducted at department of obstetrics and gynaecology of SMGS Hospital among pregnant women with single pregnancy during the study period of one year. Ethical clearance was taken from institutional ethics committee before commencement of study. Patients of the study were asked to sign an informed consent form after explaining them the complete procedure.
A sample size of total 100 pregnant patients were selected on the basis of inclusion and exclusion criteria.

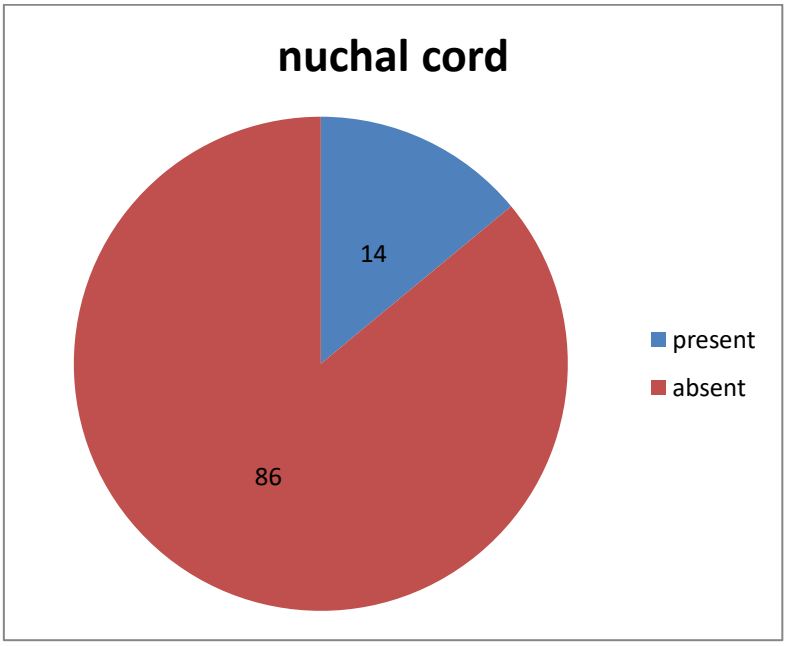
Inclusion criteria- The study included women who had singleton pregnancies and were admitted in the labourroom with signs of labour in third trimester, as well as those whose babies had an umbilical cord wrapped around their necks at the time of delivery.

Exclusion criteria- Women who gave birth before 34 weeks of pregnancy, women who had a high risk factor that could affect the outcome of childbirth, pregnancies with complications such as fetal death, abnormal fetal positions, multiple pregnancies, significant fetal malformations, nuchal cord detected by ultrasound, and women who had a planned cesarean section for other obstetric reasons.
The eligible women were allowed to follow the course of labor and either delivered vaginally or by cesarean section (wherever indicated). At the time of birth, cord around the neck was noted. In babies with nuchal cord, the type of loop (nuchal cord was considered to be loose when it could be easily released before delivery of the fetal trunk and tight when it needed to be clamped and cut before delivery of the trunk) and number of loops were also documented. The cases with nuchal cord at the time of delivery were taken as group P and those which did not have nuchal cord served as the group A. The primary outcome noted was the incidence of nuchal cord. The secondary outcome variables noted were mode of delivery and Apgar score of newborn at 1 and 5 minutes and admission to neonatal intensive care unit (NICU).
The results were reported as the mean value plus or minus the standard error of the mean (SEM), or as a number or median, depending on the situation. Comparisons between the two groups were conducted using Fischer's test or Chi-square test, depending on the suitable circumstances. A significance level of $P < 0.05$ was used to determine statistical significance.

RESULTS

In the present study, nuchal cord was present in 14 patients named as group P and was absent in 86 patients named as group A as shown in figure 1. Among them 11 patients had one loop, 2 patients had two loops and 1patient had three loops as shown in figure 2. In 8 patients, tight nuchal cords were present and, in 6patients, there were loose loops as shown in figure 3.

Figure 1 Incidence of nuchal cord



DOI: 10.69605/ijlbpr_13.7.2024.80

Figure 2 Distribution of patients on the basis of number of loops present

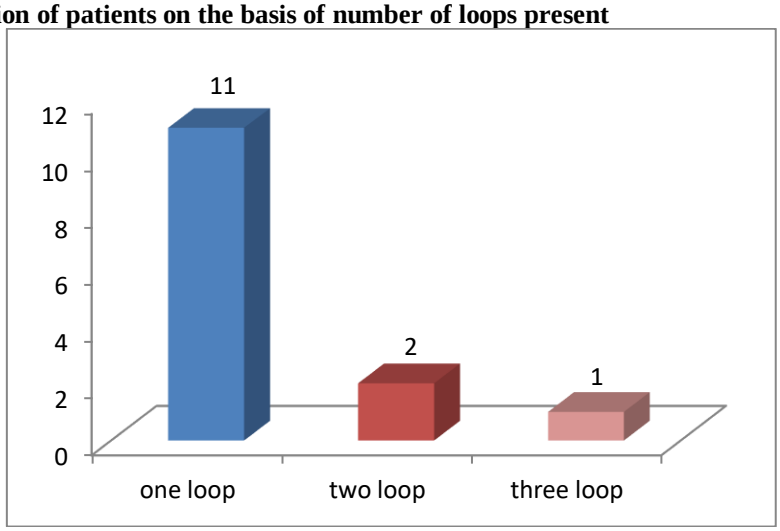
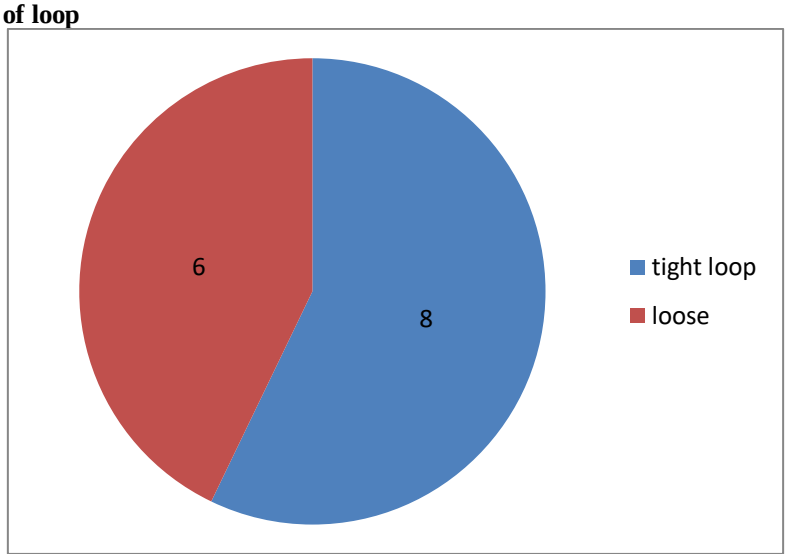


Figure 3 Strength of loop



The current study found that the existence of nuchal cord did not have an impact on the mode of delivery, as shown in Table 1 (p = 0.915), which is not statistically significant. Consequently, the incidence of harm to the mother can be diminished by permitting patients with nuchal cord to give birth vaginally.

Table 1: mode of delivery in relation to nuchal chord present

Group	Normal delivery	Instrumental delivery	Cesarean delivery	P value
Group P	57.14%	14.2%	28.5%	0.915
Group A	56.97%	16.2%	26.7%	

The statistical analysis did not find a significant association between an Apgar score below 7 at 1 and 5 minutes and admission to the Neonatal Intensive Care Unit (NICU). This suggests that the existence of a nuchal cord does not affect the adaptability of the newborn, as shown in table 2.

Table 2 APGAR score of newborn in relation to nuchal cord.

APGAR score	Group P	Group A	P value
<7 at 1 minute	64.2%	65.1%	0.441
<7 at 5 minute	14.2%	13.9%	0.934
NICU admission	21.4%	20.9%	0.923

DISCUSSION

The perinatal result of a nuchal cord is a subject of debate and disagreement.

Multiple studies have indicated that the presence of a nuchal cord is linked to negative outcomes during childbirth.[9] In contrast, several research have failed to show any detrimental impact of nuchal cord (NC) on the fetus. These investigations have indicated that nuchal cord is a common occurrence during childbirth and is rarely linked to any complications for the

DOI: 10.69605/ijlbpr_13.7.2024.80

newborn.[10] Consequently, there is a current dispute on the prenatal consequences of nuchal cord.

A research published in the in 1995 found that the occurrence of nuchal cord rises from 5.8% at 20 weeks of gestation to 29% at 42 weeks.[11] In this study, the occurrence of nuchal cord was found to be 14% among all deliveries that occurred beyond 28 weeks of gestation. The occurrences are similar in comparable research, where the prevalence varies between 14 and 18%.[12,13]

Approximately 2 to 8% of all deliveries are predicted to be affected by the presence of two or more loops of nuchal cords.[1] The study found that the occurrence of single nuchal cords, where the umbilical cord is wrapped around the baby's neck once, was 78.5%. Additionally, the incidence of multiple nuchal cords, where the cord is wrapped around the neck two or more times, was 21.5%. Compared to other similar research, this study found a substantially higher incidence rate. Specifically, the incidence rate for single loops was reported to be between 18% and 29%, whereas for numerous loops it was between 3% and 5%.[11,13] The rise in occurrence can be ascribed to the reduced sample size of the study. Tight loops were found to be slightly more common (8) than loose loops (6) In contrast to a comparable cross-sectional study, loose loops were shown to be more common than tight loops. However, the study was unable to determine the underlying cause for this difference.[11]

The current study found that the rate of instrumental delivery was not statistically significant, which contradicts the results of earlier similar investigations.[14] The rate of cesarean section, however, was lower in the study group, but this difference was not statistically significant. Sheiner et al and Mastrobattista et al conducted research that showed a notable decrease in the cesarean section rate among individuals with nuchal cord.[4,12]

The Group P did not show a significantly higher incidence of Apgar scores below 7 at 1 minute compared to the group A. This indicates that there is very little occurrence of birth asphyxia due to cord compression during labor. The Apgar score of less than 7 at 5 minutes and subsequent admission to the neonatal unit did not show a significant increase, indicating that nuchal cord compression does not significantly affect the initial adjustment of the newborn. The findings are comparable to those of other analogous investigations.[11] Nevertheless, the research conducted by Peregrine et al. demonstrated that the presence of a nuchal cord did not have a significant impact on the likelihood of an Apgar score below 7 at 1 minute.[15]

There are some limitations to the study like it was a unicentric study with limited sample size, therefore for generalizing the results a multicentric study with large sample size needs to be done.

CONCLUSION

From the current study it was concluded that, the incidence of nuchal cord was found to be 14%. The presence of a nuchal cord did not have a statistically significant effect on the method of delivery, thus vaginal delivery can be considered minimizing the mother's morbidity. The perinatal outcome of the newborns, as assessed by the Apgar score and the rate of admission to the Neonatal Intensive Care Unit (NICU), did not show any statistically significant differences. There is no connection between nuchal cord and negative outcomes during childbirth.

REFERENCES

1. Crawford JS. Cord Round the Neck. Acta Paediatrica. 1962;51(5):594-603.
2. Peesay M. Nuchal cord and its implications. Matern Health Neonatol Perinatol. 2017;3:28.
3. Clapp JF, Stepanchak W, Hashimoto K, Ehrenberg H, Lopez B. The natural history of antenatal nuchal cords. Am J Obstet Gynecol. 2003;189(2):488-93.
4. Miser WF. Outcome of infants born with nuchal cords. J Fam Pract. 1992;34(4):441-5.
5. Rhoades DA, Latza U, Mueller BA. Risk factors and outcomes associated with nuchal cord. A population-based study. J Reprod Med 1999; 44: 39–45.
6. Jauniaux E, Mawissa C, Peellaerts C, Rodesch F. Nuchal cord in normal third-trimester pregnancy: a color Doppler imaging study. Ultrasound Obstet Gynecol 1992; 2: 417–419.
7. Hanaoka U, Yanagihara T, Tanaka H, Hata T. Comparison of three-dimensional, two-dimensional and color Doppler ultrasound in predicting the presence of a nuchal cord at birth. Ultrasound Obstet Gynecol 2002; 19: 471–474.
8. Peesay M. Cord around the neck syndrome. BMC Pregnancy Childbirth. 2012; 12 (l 1):A6.
9. Collins JH, Collins CL, Weekwerth SR, De Angelis L. Nuchal cords: timing of prenatal diagnosis and duration. Am J Obstet Gynecol. 1995;17:768.
10. Sheiner E, Abramowicz JS, Levy A, Silberstein T, Mazor M, Hershkovitz R. Nuchal cord is not associated with adverse perinatal outcome. Arch Gynecol Obstet. 2005;274(2):81-3.
11. Larson JD, Rayburn WF, Crosby S, Thurnau GR. Multiple nuchal cord entanglements and intrapartum complications. Am J Obstet Gynecol1995;173:1228-1231.
12. Chapman E. Improvement of Midwifery. London. 1753;126.
13. Weber T. The influence of cord complications on fetal pH, neonatal Apgar score, and the acid base state and oxygenation of the umbilical artery and vein. J Perinat Med. 1981;9: 134-140.
14. Shrestha NS, Singh N. Nuchal cord and perinatal outcome. Kathmandu Univ Med J 2007 Jul-Sep;5(3):360-363
15. Peregrine E, O'Brien P, Jauniaux E. Ultrasound detection of nuchal cord prior to labour induction and the risk of caesarean section. Ultrasound Obstet Gynecol 2006 Feb; 25(2):160-164.