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PREVALENCE OF NUCHAL CORD IN CEPHALIC VERSUS BREECH PRESENTATION

Muhammad Arshad, Zimar Arshad, Talia Arshad, Darooj Arshad, Iffat Noureen, M Arshad Manzoor

Department of Diagnostic Radiology, Fauji Foundation Hospital, Bedian Road, Lahore cantt.

Abstract:

Objective: *To determine the prevalence of Nuchal cord in Cephalic Versus Breech presentation in Pakistani women.*

Study design: *Cross sectional validation study.*

Place and duration of study: *Department of Diagnostic Radiology, Fauji Foundation Hospital, Bedian Road, Lahore cantt from1st April 2018 to 31 Aug 2018.*

Material and Methods: *The study was conducted on Color Doppler assessment of 100 x second/ third trimester obstetric ultrasound examinations with fetuses in Cephalic presentation and 100 cases in Breech presentation, who reported for routine obstetric examinations irrespective of ethnicity.*

Results: *The prevalence rate of Nuchal cord in Cephalic presentation in Pakistani population was 56% as compared to low prevalence rate of 33 % in Breech presentation.*

Conclusion: *Our study found high prevalence rate of 56% of Nuchal cord in Cephalic presentation in Pakistani population as compared to low prevalence rate of 33 % of Nuchal cord in Breech presentation.*

Key words: *Cephalic, Breech, Nuchal cord, Prevalence.*

Corresponding author:

Muhammad Arshad,

Department of Diagnostic Radiology,
Fauji Foundation Hospital,
Bedian Road, Lahore cantt.

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INTRODUCTION:

In 1962, J. Selwyn Crawford defined nuchal cord "360 degrees around the fetal neck". In 1770, the first edition of the Encyclopedia Britannica (P.421), there were 20 pages written about Umbilical cord pathology including drawings of umbilical cord entanglement. Aristotle (384–322 BC) originally identified the umbilical cord as the connection between the mother and unborn child[1]. In a book published in 1896, Gould[2] referred to a statement by Hippocrates (460 BC–ca. 370 BC) on nuchal cord as one of the dangers of the eighth month. A chapter in Williams Obstetrics (16th Edition, 1980) states, "Coils (nuchal cords) occur in about 25% of cases". The umbilical cord (UC) is the essential life-sustaining connection between fetus and placenta. The fully developed umbilical cord normally contains two umbilical arteries, one umbilical vein, the remnant of the allantois; all embedded in Wharton's jelly and surrounded by a single layer of amnion [3] (Figure-1).

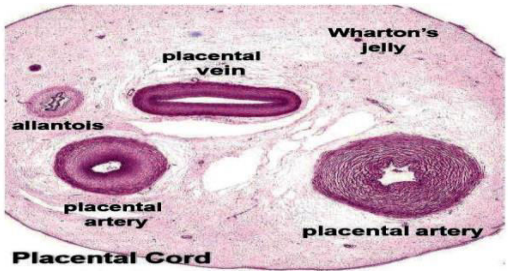

Figure- 1: A cross-sectional image of a postpartum umbilical cord showing the major structures (Hill M. UNSW Embryology. Placenta Histology).

Examination of cord vessels using Doppler ultrasound enables investigators to deduce the state of the fetoplacental vascular bed, providing essential information on the condition of the fetus[4]. Color doppler ultrasound is the gold the standard to evaluate the nuchal cord (Figure- 2). This seems to correctly identify 72% of single and 94% of multiple nuchal cords, with greatest sensitivity after 36 weeks (93% vs. 67%) [5].

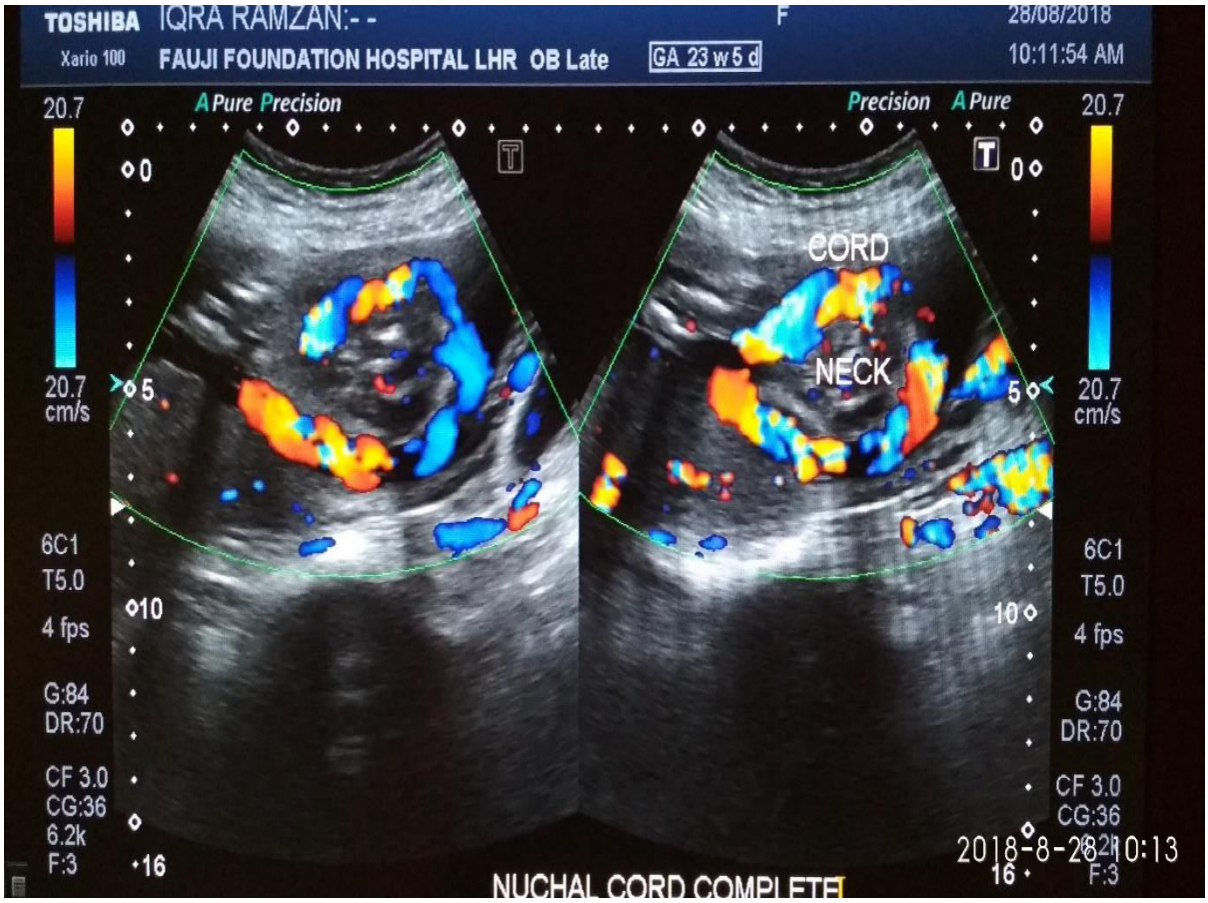

Figure- 1: Fetal color doppler ultrasound of Tight Nuchal cord.

At birth, the mature cord is about 50–60 cm in length and 12 mm in diameter. A long cord is defined as >100 cm and a short cord as <30 cm [6]. Excessively long cords may be associated with prolapse, looping of the cord around the fetal neck, entanglement, distress and fetal demise [7]. On the other hand, short cords may be associated with delayed fetal descent, premature placental separation [8], growth restriction, congenital abnormalities, fetal distress and demise.

The implications of nuchal cords are controversial. Several studies have noted an association between nuchal cords and adverse perinatal outcome. In addition, umbilical cord compression due to tight nuchal cords could be an incidental finding that is seldom associated with perinatal morbidity. The cluster of cardiorespiratory and neurological signs and symptoms associated with unique physical features that occur secondary to tight cord-round-the-neck has been referred to as 'tCAN syndrome' (tight Cord Around the Neck Syndrome) [9]. Nuchal cord (NC) is one of the possible causes of birth asphyxia [10]. This all makes sense to know the frequency of this finding and the reason for conducting this study was to analyze a section of Pakistani population to detect comparative prevalence of nuchal cord in cephalic and breech presentation.

MATERIAL AND METHODS:

This comparative cross-sectional study was conducted in the Department of Diagnostic Radiology, Fauji Foundation Hospital, Bedian Road, Lahore cantonment, Pakistan. 100 random cases of Cephalic presentation and 100 cases of Breech presentation were included in study to find nuchal cord at gestational age of 20-40 weeks. A Proforma was completed for each patient recording age, sex, gestational age, presence or absence of nuchal cord, and type of nuchal cord. These patients were selected according to non-probability convenient sampling. Most of the patients were civilian from central Punjab. All the patients underwent Doppler analysis on commercially available high-resolution Ultrasound equipment (Xario-100 Color Doppler, by Toshiba, Japan) having 3.5 to 5.5 MHz curved linear array transducer and color flow mapping/ pulsed Doppler technique. Prints of the study were captured on Video Graphic Printer MP-895 MD (Sony). All fetuses were reviewed with color and spectral doppler examination to find out umbilical cord around the fetal neck. The examination was performed by one of the two consultant radiologists. Patients were examined while relaxed and supine. The end of the probe was covered with Aqua Sonic Ultrasound Gel. The average scanning time was 15 minutes for complete examination.

Entry criteria were singleton pregnancy, gestational age between 20 and 40 weeks, cephalic and breech presentation and estimated fetal weight below the 95th percentile for gestational age. The nuchal cord group included cases with at least one loop of the umbilical cord around the neck only. Cases of multiple gestations; transverse and variable lie of fetus were excluded.

RESULTS:

In our study, 200 cases were examined for Nuchal cord, including 100 fetuses in cephalic presentation and 100 fetuses in breech presentation. Median gestational age in cephalic presentation was 34 weeks 3 days and in breech presentation was 23 weeks 3 days. Out of cephalic presentation, 56 cases were positive for nuchal cord and out of breech presentation, 33 cases were positive for nuchal cord. Statistical analysis was performed using the SPSS 21.0 for Windows (SPSS Inc, Chicago, IL). Frequencies along with 95% Confidence Intervals (95%CI) were determined. Comparisons for categorical variables were conducted using the chi-square test of significance. Level of significance (p value) was take at 0.05.

Table- 1: Frequencies with 95% Confidence Intervals (CI) of Nuchal and no Nuchal Cases in Cephalic and Breech Presentations (n=200)

	Cephalic presentation	Breech Presentation
Total cases studied	n= 100	n= 100
Nuchal cord cases	56 (95%CI: 45-64)	33 (95%CI: 23-42)
No nuchal cord cases	44 (95%CI: 43-55)	64 (95%CI: 54-73)

Out of total 89 cases of nuchal cord, only two revealed more than single loops of umbilical cord. The comparative study between cephalic group and breech presentation group showed significant difference in incidence of nuchal cord ($P \leq 0.05$).

DISCUSSION:

Although high rates of nuchal cord have been documented in native and international population, no study has examined the comparative rate of the disease between cephalic and breech presentation among native women. The author conducted the present validation study to estimate comparative prevalence of nuchal cord in these two groups which may result in perinatal mortality. We found overall prevalence rate of Nuchal cord in Cephalic and Breech presentation to be 56% and 33 %; with

overall prevalence 44.5% which is high as compared to local and international studies. Our data as compared to prior studies suggested high prevalence of nuchal cord in Cephalic presentation but was comparable in Breech presentation.

In one retrospective analysis, about 28% of all pregnancies had a nuchal cord [11]. The incidence of nuchal cord increases with advancing gestation from 12% at 24 to 26 weeks to 37% at term [12], following an almost linear distribution. Another study suggested that Umbilical cord loops around fetal neck are increasingly common as gestational age increases with an incidence of up to 33% at term[13]. One study reported decreasing relationship of nuchal cord with increasing gestational age; with the highest rates of 43% in the 13th to 16th gestational week and 8.3% in newborns [14]. Out of the 1,000 cases studied by Nilesh Unmesh et. al, 207 had nuchal cords (i.e., 20.7 %) [15].

Local studies have also been conducted which suggested low prevalence of nuchal cord as compared to our data. Nuchal cords occur at rates of 30-34% at 40 weeks and are not associated with adverse perinatal outcomes[16]. In second study, incidence of nuchal cord was 10.6% and the nuchal cord was not associated with adverse perinatal outcome and should not influence mode of delivery[17]. In a study conducted in 2017, nuchal cord was detected in 59 out of 184 neonates (32%), including a single loop in 55 (29.8%), a double one in 4 (2.1%) and a triple one in a single case (0.5%) [18].

Shazia T et al suggests that presence of nuchal cords is a frequent finding and it increases the rate of cesarean section [19]. In a very recent study, the prevalence of a nuchal cord was 16.87%[20]. In another study, the incidence of nuchal cord 23.5%[21]. Thus, overall incidence of 44.5% of nuchal cords noted in our study is more than numbers reported in local and international studies

CONCLUSION:

Our study found high prevalence rate of **56**% of Nuchal cord in Cephalic presentation in Pakistani population as compared to low prevalence rate of 33 % of Nuchal cord in Breech presentation; with overall prevalence of 44.5%.

RECOMMENDATION

Our study strongly recommends routine use of Color Doppler sonography of the umbilical cord for better perinatal management. This may help in reduction of later morbidity/ mortality associated with Nuchal cord.

Similar studies should be done in native population to provide a more complete picture of the situation.

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