

CORRELATION OF UMBILICAL CORD LENGTH WITH NORMAL AND ABNORMAL PRESENTATIONS

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SUMMARY

Umbilical cord length is shorter in breech presentation as compared to vertex ($p < 0.01$). There is no statistical difference in umbilical cord length in other presentations as compared to vertex presentation. Cord length is longer in males ($p < 0.05$) as compared to females irrespective of presentation.

In breech versus vertex presentation, cord is found to be shorter in former irrespective of parity of mother, sex and gestational maturity of newborn.

INTRODUCTION

Extensive studies have tried to correlate various maternal and fetal factors to abnormal presentation but only few have taken cord length into account for breech presentation, while no studies are available regarding cord length in other abnormal presentations.

There are wide variations in length of umbilical cord and various theories have been put forward to explain this. Malpas (1964) suggested that the cord is an example of unconditioned vessel growth. Agboola (1978) stated that the factors responsible for vascular growth may be linked with Hoboken valves or endothelial cushions in umbilical artery and with intravascular pressure in umbilical artery. Miller (1981) suggested that the umbilical cord growth occurs in response to

tensile forces which in turn relate to the intrauterine space availability and fetal movement during early development. Thus finding of short cord may indicate diminished fetal movements from either early intrauterine constraints or fetal limbs dysfunction. Mossinger et al (1982) from his experimental study on rat fetus reports that the restricted fetal movements by oligohydramnios lead to short cord. Similarly suppression of fetal movements by curarization leads to short cord irrespective of amniotic fluid volume.

Soernes (1986) reports cord to be shortened in breech presentation as compared to vertex presentation. This study is based on these two theories (1) The umbilical cord length is influenced by fetal motor activity. (2) That the breech presentation is associated with low fetal motor activity.

The present study was undertaken to find the correlation of umbilical cord length to normal and abnormal presentations.

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MATERIAL AND METHOD

The present study was conducted in Department of obstetrics and gynaecology, M.A.M.C. and associated L.N.J.P.N. Hospital. 1000 consecutive patients admitted in labour with period of gestation more than 28 weeks were included in the study. Multiple pregnancies were excluded. Obstetrical history was taken and detailed general, physical and obstetrical examination was done. Labour was monitored and presentations confirmed in labour clinically. After delivery of fetus, cord was clamped at two places and cut in between. Umbilical cord was cut routinely 3 cms. from fetal abdomen. Rest of the cord was measured in centimeters by steel rule. 3 cms of cord length attached to fetus was added to get the total cord length. Sex and maturity of newborn was noted.

OBSERVATIONS

Vertex presentation included cases which ultimately delivered as occipito-anterior. Vertex presentations which remained as occipito-poste-

rior were grouped together separately. The difference in the mean length of umbilical cord length between various presentations and the statistical significance is depicted in Table I. Average cord length is shorter in breech presentation as compared to vertex presentation. The difference noted between the two presentations is 6.18 cm which is statistically significant ($p < 0.1$). Difference in the length of umbilical cord between vertex and various presentations other than breech are not statistically significant and so umbilical cord length in the vertex versus breech presentation only was studied in detail.

Table II shows the details of correlation of cord length with sex, parity and maturity in vertex and breech presentation. In vertex presentation, difference in the length of umbilical cord between male and female infant is statistically significant $p < 0.05$, cord is significantly shorter in primi as compared to multipara $p < 0.01$ and mature babies have significantly more cord length as compared to premature babies $p < 0.001$.

In breech presentation, there is statistically

Table - I

Mean umbilical cord length in different presentations

Presentation	Group	Mean Cord length in Cms.		Significance
		(i)	(ii)	
Vertex (n 917)	& breech (n 55)	55.69 ± 16.24	49.61 ± 13.94	$p < 0.01$
Vertex (n 917)	& transverse lie (n 9)	55.79 ± 16.24	60.55 ± 10.07	$p > 0.05$
Vertex (n 917)	& Face, Brow (n 3)	55.79 ± 16.24	50.00 ± 7.0	$p > 0.05$
Vertex (n 917)	& Compound (n 3)	55.79 ± 16.24	67.66 ± 16.16	$p > 0.05$
Vertex (n 917)	& persistent occipito-posterior (n 13)	55.79 ± 16.24	62.84 ± 13.63	$p > 0.05$

Table : II

Correlation of umbilical cord length with Sex, Parity and Maturity Vertex and Breech Presentations.

	Vertex						Breech					
	Sex		Parity		Maturity		Sex		Parity		Maturity	
	Male	Female	Primi	Multi	Pre-Mature	Mature	Male	Female	Primi	Multi	Pre-Mature	Mature
No. of cases	511	406	406	511	145	772	28	27	20	35	13	42
Mean cord length (in cms.)	57.27	53.94	53.57	57.56	49.19	57.04	53.64	45.44	51.80	48.37	44.84	51.09
Standard Deviation (in cms.)	17.43	14.40	16.50	15.82	13.78	16.37	14.57	12.14	14.35	13.75	6.70	15.27
Significance	p < 0.05		p < 0.01		p < 0.001		p > 0.05		p. 0.05		p > 0.05	

significant difference in umbilical cord length between male and female fetus ($p < 0.05$) while there is no statistically significant difference in cord length in different parities of mother and between mature and premature babies. Female babies were more in number in breech presentation as compared to vertex. Conclusively umbilical cord length is shortened in breech as compared to vertex presentation irrespective of parity of mother, sex of newborn and gestational maturity. Umbilical cord length of female fetuses in breech versus vertex presentation is shorter in former.

DISCUSSION

In this study umbilical cord length was found to be shorter in breech as compared to vertex presentation while there was no statistical difference in cord length in vertex as compared to other presentation.

Gardner (1922) stated that the cord length in breech presentation had to be longer (at least 55 cm) as compared to vertex presentation if uncomplicated birth is to occur but he did not present any data to support his assumption.

Tompkins (1946) reports that "classical factors" like contracted pelvis, pelvic tumours, placenta praevia and fetal malformations, in aggregate account for only one sixth of breech births among mature single infants. He further suggests that extension of legs may be causative factor rather than a resultant effect in breech presentation. Foetal activity is seldom mentioned in the etiology of breech presentation. Tompkins (1946) remarks that if a clinician purposefully enquires about the degree of fetal activity at each antepartum visit he will note that when relative inactivity is reported, the baby is often found in breech presentation; whether fetal activity decreases before or after the baby assumes the breech presentation has not been determined. He

suggests that babies who have impaired power of movement and babies whose movements are restricted by extension of legs would have less chance of extricating themselves from the breech presentation to vertex as compared to vigorous babies with flexed legs.

Soernes (1986) also reported cord length to be shorter by 4.5 cm in breech presentation as compared to vertex ($p < 0.001$) supported the two theories (1) that the umbilical cord length is influenced by fetal motor activity and (2) the breech presentation is associated with low foetal motor activity.

In the present study also umbilical cord length is significantly shorter in breech presentation as compared to vertex presentation irrespective of parity of mother, sex and gestational maturity of newborn. Number of female foetuses is more when presentation is breech as compared to vertex presentation and this may also be a contributing factor for shorter cord length in breech as cord is significantly shorter in female foetus as compared to male foetuses irrespective of presentation. If we compared the umbilical cord length only of female foetuses in breech versus vertex presentation, even then the umbilical cord length is shorter in former.

To conclude, the cord is shorter in breech as compared to vertex presentation. Whether this is cause or effect of this abnormal presentation is yet to be determined.

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