



ORIGINAL RESEARCH PAPER

Anatomy

TO STUDY THE RATIO OF WEIGHT OF FETUS AND WEIGHT OF FETAL SPLEEN IN NORTHERN POPULATION- AN OBSERVATIONAL STUDY

KEY WORDS: Weight of fetus, weight of spleen, Ratio

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ABSTRACT

Introduction: The spleen is one of the secondary lymphoid organs in our body. The size of the spleen is used as an indicator of disease activity in reticuloendothelial system. Splenomegaly is an important diagnostic clue to the existence of an underlying disorder. Fetal splenomegaly occurs in cases of congenital transplacental infections, hematologic diseases, immunological disorders and lipidoses. Limited research work is available about the relationship between weight of fetus and weight of the fetal spleen. The present study is done with an aim to study the relationship between the growth of the fetus (weight) and fetal spleen (weight) in different gestational age groups. **Material & Method:** It was an observational study, conducted for the duration of one year (2018-2019) after obtaining the permission of institutional ethics committee. Fetuses of 16 weeks to 40 weeks of gestational age were collected from the department of OBG in DRPGMC Kangra at Tanda. Fetuses with congenital malformations were excluded in the study. The measurements: weight of fetus, weight of fetal spleen and ratio between fetal weight and spleen weight were measured. **Results:** The mean weight of spleen was 0.74gm in the group A which increased to 1.72gm in the group B. In group C the weight was 5.71gm. Maximum increase of 3.99 gm has been observed between group B and C. Minimum increase of 0.98 gm was noticed between group A and B. The mean fetal weight was 354 gm in the group A and 1010 gm in the group B. In group C the average fetal weight was 1965 gm. Maximum increase of 955 gm has been observed between group B and C. Minimum increase of 656 gm was noticed between group A and B. **Conclusion:** The knowledge of pattern of growth of fetal spleen is very useful to diagnose various pathologies.

INTRODUCTION

The spleen is one of the secondary lymphoid organs in our body.¹ The size of the spleen is used as an indicator of disease activity in reticuloendothelial system. Measurement of spleen in the routine clinical practice is a very good indicator of actual size of spleen.² In the literature, there is limited research about the size and weight of fetal and infant spleen.

Splenomegaly is an important diagnostic clue to the existence of an underlying pathology. Fetal splenomegaly occurs in cases of congenital transplacental infections, immunological disorders, hematologic diseases, and lipidoses.³ In some chromosomal disorders like Di George syndrome and Sickle cell disease a hypoplastic spleen is found. So measurement of fetal spleen can be a useful diagnostic tool in the detection of congenital pathologies of spleen in utero.⁴ The parenchyma of spleen may regenerate after partial removal of organ.⁵

In adults, the average size of a spleen is 12 cm in length, 7 cm in breadth and 3 cm in thickness. Its average adult weight ranges from 80-300 grams.⁶ Variation in the weight of spleen is documented with age. It is comparatively largest in the young child and although it increases during puberty, by adulthood it is relatively smaller in comparison to the neighbouring organs.⁷ The spleen tends to decrease in size and weight in senescence.⁵ The average adult weight is dependent on the volume of contained blood and emptied of blood.⁸ The present study is about to assess the ratio between fetal weight and spleen weight.

MATERIAL METHODS

It was an observational study, conducted for the duration of one year 2018-2019. Fetuses of 16 weeks to 40 weeks of gestational age were collected from the department of OBG in DRPGMC Kangra at Tanda. Fetuses with congenital malformations were excluded in the study. Consent was taken from parent or parents. Weight of fetuses was measured on weighing machine and spleen was weighed in chemical balance and recorded in grams.

The fetuses were categorized according to the gestational

age as following:-

Table 1: Group Distribution

Sr No.	GROUPS	GESTATIONAL AGE
1	A	12-24 wks
2	B	25-36 wks
3	C	>36 wks

ETHICAL JUSTIFICATION AND CONSIDERATIONS

This study did not require any experimentation to be done on the participant. All the procedures have performed as per guidelines issued by Indian Council of Medical Research and Halinski declaration 2008. Each participant has information of aims, methods and anticipated benefits of the study.

STATISTICAL ANALYSIS

The collected data were entered in Microsoft excel spread sheet and were analysed using suitable statistical parameters.

RESULTS

Weight of Spleen

The mean weight of spleen was 0.74gm in the group A which increased to 1.72 gm in the group B. In group C the weight was 5.71gm. Maximum increase of 3.99 gm has been observed between group B and C. Minimum increase of 0.98 gm was noticed between group A and B.

Fetal Weight

The mean fetal weight was 354 gm in the group A and 1010 gm in the group B. In group C the average fetal weight was 1965 gm. Maximum increase of 955 gm has been observed between group B and C. Minimum increase of 656 gm was noticed between group A and B.

Table 2: Mean Of Fetal Wt And Spleen Wt And Their Ratio

Groups	Gestation al Age	Average Fetalweight	Average Spleen Weight	Ratio
A	12-24 wks	354 gm	0.74 gm	0.2%
B	25-36 wks	1010 gm	1.72 gm	0.17%
C	>36 wks	1965 gm	5.71 gm	0.29%

COMPARISON OF SPLEENWEIGHT OF PRESENT STUDY WITH OTHER STUDIES

According to Dr. Ramanujam⁸, in the 12-24 week of gestation average fetal weight was observed as 700-800 gm & average spleen weight was observed as 2.6-2.8 gm and ratio between two was 0.35%. In the 24-36 weeks of gestation, the average fetal weight was observed as 1200-1300 gm & average spleen weight was observed as 4.4-4.6 gm and ratio between two was 0.35%. In group C (more than 36 weeks of gestation), the average fetal weight was observed as 2000-2200 gm & average spleen weight was observed as 7.0-7.2 gm and ratio between two was 0.33% observed.

According to Shaik Hussain¹⁰, the average fetal weight and average spleen weight of gestational age between 12 to 24 weeks were 800 gm and 2.84 gm respectively and ratio between two was 0.35%, in gestational age between 25 to 36 weeks the average fetal weight and average spleen weight were 1321.42 gm and 4.52 gm respectively ratio between two was 0.34%. In group C (greater than 36 weeks) the average fetal weight and average spleen weight were 2100 gm and 7.07 gm respectively ratio between two was 0.33%.

In the present study, the average fetal weight and average spleen weight of gestational age between 12 to 24 weeks were 354 gm and 0.74 gm respectively and ratio between two was 0.2%, in group B (25 to 36 weeks) the average fetal weight and average spleen weight were 1010 gm and 1.72 gm respectively ratio between two was 0.17% and in group C (greater than 36 weeks) the average fetal weight and average spleen weight were 1965 gm and 5.71 gm respectively and ratio between two was 0.29%. There was gradual increase in average spleen weight with the increase in average fetal weight.

An increase of average spleen weight from group A to C was 3.99 gm in the present study. In the study by Dr. Ramanujam⁸ and Shaik Hussain¹⁰ the increase was 4.23 gm and 4.4 gm respectively.

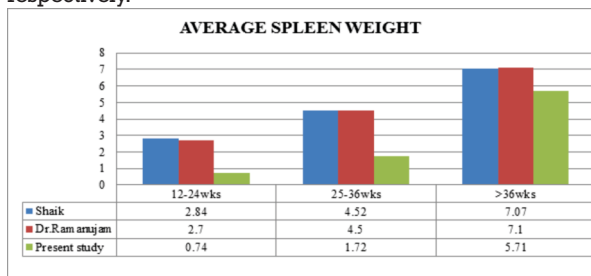


Fig 1: Comparison Of The Average Weight Of Spleen In The Fetuses Of Group A, B And C In The Present Study With The Study By Other Authors.

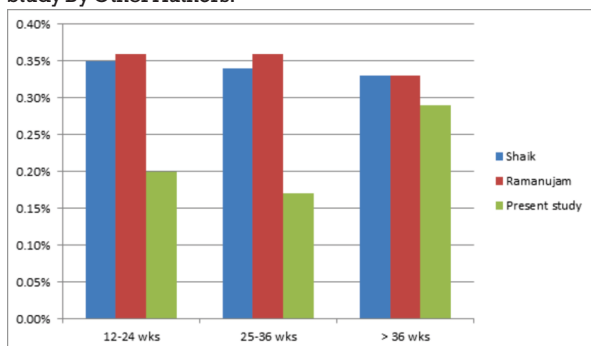


Fig 2: Comparison Of Ratio Of Fetal Weight And Spleen Weight Of Present Study With Other Studies

DISCUSSION

In our study it was observed that the pattern of increase in the weight of spleen is proportional to the pattern of increase in weight of fetus. Ratio of fetal weight and spleen weight

showed maximum increase near term but not in other studies.^{9,10}

CONCLUSION

It is concluded that the knowledge of pattern of growth of fetal spleen is very useful to diagnose various pathologies in paediatric medicine and surgery.

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