



Obstetrics & Gynaecology

A STUDY TO FIND ASSOCIATION OF DISTANCE BETWEEN YOLK SAC AND EMBRYONIC POLE WITH FETAL OUTCOME IN THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, SMS MEDICAL COLLEGE, JAIPUR

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ABSTRACT

BACKGROUND: Miscarriage often occurs before 20 weeks of gestation, with 75% happening before the 16th week. Early pregnancy failure is common in the first trimester. The Distance between Yolk Sac and Embryonic Pole (DYSE) is a valuable tool for assessing early pregnancy health. This non-invasive method helps predict pregnancy outcomes and identify risks of loss, allowing for timely intervention and support. **METHODS:** This prospective study at SMS Medical College, Jaipur, involved women with live pregnancies between 6-10 weeks of gestation. Participants consented to the study and underwent endo-vaginal ultrasonography to measure DYSE. Women were divided into two groups: Group A (DYSE $\leq$ 3mm) and Group B (DYSE $>$ 3mm). The smallest DYSE measurement from three evaluations was used. Women were followed up at 13 weeks for fetal outcomes. **RESULTS:** Significant differences in outcomes were observed between groups. Group A had a higher incidence of abortions compared to Group B. **CONCLUSION:** DYSE measurement is a critical, non-invasive, and cost-effective tool for early pregnancy assessment. It improves early detection of high-risk pregnancies, enhances patient care, and reduces the emotional impact of early pregnancy loss.

KEYWORDS : DYSE, early pregnancy loss, miscarriage, ultrasound, pregnancy assessment

INTRODUCTION

Pregnancy loss, commonly known as miscarriage, is a nonviable intrauterine pregnancy that can occur up to 20 weeks of gestation, with early losses being the most common. About 75% of these losses happen before the 16th week, and a majority occur before the 12th week. Early pregnancy failure impacts many pregnancies and is influenced by various factors.

DYSE (Distance between Yolk Sac and Embryonic Pole) measurement is a valuable non-invasive tool in early pregnancy assessment. It provides direct insights into embryo development and positioning within the gestational sac. This method complements traditional diagnostic approaches by offering real-time evaluation, which can help predict pregnancy outcomes and identify potential risks. The integration of DYSE measurement into clinical practice represents a significant advancement in prenatal care, allowing for timely intervention and support.

This study aims to explore the predictive value of DYSE measurement, its clinical implementation, and its impact on healthcare delivery, focusing on enhancing early diagnosis and mitigating emotional distress associated with pregnancy complications.

METHODS

A prospective observational study titled "A Study to Find the Association of Distance Between Yolk Sac and Embryonic Pole" was conducted at SMS Medical College, Jaipur. Women with live pregnancies between 6-10 weeks of gestation attending the OPD were included after providing written and informed consent. Following a comprehensive history and physical examination, participants underwent endo-vaginal ultrasonography to measure DYSE and confirm cardiac activity.

Participants were categorized into two groups:

Group A: DYSE $\leq$ 3mm

Group B: DYSE $>$ 3mm

DYSE measurement was performed using sagittal ultrasonographic sections, evaluating three distances from the inferior pole of the embryo to the yolk sac, with the smallest distance recorded. Participants were followed up at 13 weeks gestation to assess pregnancy outcomes.

STATISTICAL ANALYSIS:

Continuous variables were analyzed using unpaired t-tests, while categorical variables were analyzed with chi-square or Fisher's exact tests. A p-value of < 0.05 was considered statistically significant.

RESULTS

TABLE- 1 Distribution of GROUP A and GROUP B according to previous history of abortion

Abortion	Group A		Group B	
	N	%	N	%
No abortion	25	69.44	26	72.22
1st	9	25.00	5	13.89
2nd	2	5.56	5	13.89
Total	36	100.00	36	100.00

Chi square 0.067, P value 0.795 (NS)

A majority of participants in both Group A (69.44%) and Group B (72.22%) had no abortions. There was no significant difference in abortion history between the two groups ($p = 0.795$).

TABLE- 2 Distribution of GROUP A and GROUP B according to period of gestation

Study group	POG (weeks)			P value
	Mean	SD	Median	
Group A	7.83	1.18	8.00	0.705
Group B	7.92	1.02	8.00	(NS)

UNPAIRED T TEST

The mean POG was 7.83 weeks in Group A and 7.92 weeks in Group B, with no statistically significant difference between groups ($p = 0.705$).

TABLE- 3 Distribution of GROUP A and GROUP B according to pregnancy outcome at 13 weeks

Outcome at 13 weeks	Group A		Group B	
	N	%	N	%
Abortion	26	72.22	8	22.22
Continued	10	27.78	28	77.78
Total	36	100.00	36	100.00

Chi-square 18.05, P value < 0.0001 (S)

There was a significant difference in outcomes between Group A and Group B at 13 weeks gestation. Group A shows a higher incidence of abortions (72.22%) compared to Group B (22.22%), whereas Group B had a higher rate of continued pregnancies (77.78%) compared to Group A (27.78%).

DISCUSSION

DYSE measurement provides a valuable ultrasound parameter for early pregnancy assessment. By evaluating the distance between the embryo and the yolk sac, it helps predict pregnancy viability. A shorter

DYSE or insufficient increase in distance can indicate developmental issues or increased risk of miscarriage. DYSE measurement is simple, cost-effective, and enhances the accuracy of early pregnancy assessments compared to traditional diagnostic methods.

In our study the mean gestation age is 7.83 weeks in GROUP A (DYSE ≤ 3 mm) and 7.92 weeks in GROUP B (DYSE > 3 mm) and there is no statistical difference between the groups ($p=0.705$).

Similarly, Razvan Ciortea et al (2018) study showed no statistically significant difference between the two groups regarding the gestational age (GA) (8.49 ± 1.59 mm for control group and 8.56 ± 1.62 case group, $p>0.05$).

Likewise, Carmen Elena Bucuri et al (2019) and Valentin Aron Constantin Oprea et al (2022) studies showed no statistically significant difference between the 2 groups ($p>0.05$) in the statistical analysis of the Gestational Age (GA). The gestation age in group 1 is 8.49 ± 1.59 (Mean in weeks $\pm$ SD) and group 2 is 8.56 ± 1.62 .

Razvan Ciortea et al (2018) also studied the correlation between sFlt-1 (soluble form of vasculo-endothelial growth factor) and DYSE in 2 groups. A DYSE ≤ 3 mm, considered an abnormal distance at gestational age ≥ 6 weeks of amenorrhea, correlates with a low-level value of sFlt-1 ($p < 0.05$) and inversely, a DYSE > 4 mm, considered normal at this gestational age, correlates with an increased value of sFlt-1 ($p < 0.05$). Therefore this study showed a correlation between the serum level of sFlt-1 and the unfavorable evolution of the first-trimester pregnancy and also that a DYSE value of less than 3 mm correlates with a low level of sFlt-1.

Carmen Elena Bucuri et al (2019) also studied the correlation of serum progesterone levels with fetal viability. In this study, 6.7% of the viable pregnancies had serum progesterone levels < 10 ng/mL, while 20.7% of the nonviable pregnancies had serum progesterone levels > 10 ng/mL; the serum progesterone at a cutoff level of 10 ng/mL was 79.3% sensitive for the diagnosis of nonviable pregnancy, and was 93.3% specific for diagnosing viable pregnancies. Also in this study, 1.1% of the viable pregnancies had a serum progesterone level < 20 ng/mL, while 4.8% of the nonviable pregnancies had a serum progesterone level > 20 ng/mL; serum progesterone at a cutoff level of 20 ng/mL was 95.1% sensitive for diagnosing nonviable pregnancies, and was 98.9% specific for the diagnosis of viable pregnancies.

This study also correlates ultrasound parameters (DYSE) with a serologic one, that is, with the progesterone serum level, bringing valuable information about the viability of the pregnancy in the 1st trimester. Low progesterone serum levels are associated with an increased rate of nonviable embryos.

Valentin Aron Constantin Oprea et al (2022) study showed a correlation between the serum level of PlGF (Placental growth factor) and DYSE and their effect on pregnancy outcome. In the statistical analysis of the values of Placental Growth factor (PlGF), statistically significant differences were found between the two groups, GROUP 1 with viable first trimester pregnancy and GROUP 2 with embryonic demise ($p < 0.001$). They detected that there is a negative correlation between the serum level of PlGF and the first-trimester pregnancy and also that a DYSE value smaller than 3 mm correlates with a low level of PlGF.

In our study, there was a significant difference in outcomes between Group A and Group B at 13 weeks gestation. Group A shows a higher incidence of abortions (72.22%) compared to group B (22.22%), whereas group B has a higher rate of continued pregnancies (77.78%) compared to group A (27.78%).

Similarly, Razvan Ciortea et al (2018) study showed a statistically significant difference when DYSE values were compared ($p < 0.001$) with pregnancy outcome.

Likewise, Carmen Elena Bucuri et al (2019) and Valentin Aron Constantin Oprea et al (2022) studies showed statistically significant differences between the 2 groups ($p < 0.001$) in DYSE values. It was found that a DYSE of < 3 mm correlates with a negative outcome of pregnancy viability.

DYSE measurement serves as a critical, non-invasive tool in early pregnancy assessment, offering accurate and cost-effective insights into pregnancy viability. It enhances patient care by enabling early detection of high-risk pregnancies and facilitating timely interventions. The use of DYSE measurement improves diagnostic accuracy, supports efficient healthcare delivery, and mitigates the emotional distress associated with early pregnancy loss.

ETHICAL CLEARANCE

Institutional review board and ethical committee clearance were obtained for this study.

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CONCLUSION