



ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

A COMPARATIVE STUDY OF ASPIRIN VERSUS ASPIRIN COMBINED WITH L-ARGININE IN THE MANAGEMENT OF OLIGOHYDRAMNIOS ASSOCIATED WITH FETAL GROWTH RESTRICTION AFTER 28 WEEKS OF GESTATION

KEY WORDS:

Oligohydramnios; Fetal growth restriction; Aspirin; L-arginine; Amniotic fluid index

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ABSTRACT

Oligohydramnios associated with fetal growth restriction (FGR) is a manifestation of uteroplacental insufficiency and is linked with increased perinatal morbidity and mortality. Improving uteroplacental perfusion remains a key therapeutic goal in such pregnancies. This randomized controlled study was conducted among 64 antenatal women beyond 28 weeks of gestation diagnosed with oligohydramnios (amniotic fluid index 5–9 cm) associated with fetal growth restriction. The participants were randomly allocated into two groups: Group A received low-dose aspirin 75 mg daily, while Group B received aspirin 75 mg combined with oral L-arginine 3 g daily. Serial assessment of amniotic fluid index, fetal Doppler parameters, gestational age at delivery, birth weight, and neonatal outcomes was performed. The combination therapy group showed a significantly greater improvement in amniotic fluid index, higher mean birth weight, and reduced neonatal intensive care unit admissions compared to aspirin monotherapy. The study concludes that the addition of L-arginine to aspirin therapy offers superior perinatal outcomes in pregnancies complicated by oligohydramnios with fetal growth restriction.

INTRODUCTION

Oligohydramnios and fetal growth restriction are common obstetric complications that reflect chronic placental insufficiency. Reduced uteroplacental blood flow leads to impaired fetal oxygenation, decreased fetal renal perfusion, and diminished amniotic fluid production. These conditions are associated with increased risks of fetal distress, operative delivery, low birth weight, and neonatal morbidity. Early identification and management are crucial to improve perinatal outcomes.

Low-dose aspirin has been shown to improve placental circulation by inhibiting platelet aggregation and reducing thromboxane production, thereby enhancing uteroplacental perfusion. L-arginine, a semi-essential amino acid, serves as a precursor for nitric oxide synthesis, resulting in vasodilatation and improved blood flow. The combined use of aspirin and L-arginine may therefore exert a synergistic effect in improving placental function, amniotic fluid volume, and fetal growth.

AIM

To compare the efficacy of aspirin alone versus aspirin combined with L-arginine in improving amniotic fluid index and perinatal outcomes in pregnancies complicated by oligohydramnios with fetal growth restriction after 28 weeks of gestation.

OBJECTIVES

1. To assess the change in amniotic fluid index following treatment.
2. To compare fetal Doppler parameters between the two treatment groups.
3. To evaluate birth weight and gestational age at delivery.
4. To compare neonatal outcomes including NICU admission.

MATERIALS AND METHODS

Study Design

Randomized controlled study.

Study Population

Sixty-four antenatal women beyond 28 weeks of gestation attending a tertiary care teaching hospital.

Inclusion Criteria

- Singleton pregnancy
- Gestational age ≥ 28 weeks
- Amniotic fluid index between 5–9 cm
- Ultrasound evidence of fetal growth restriction

Exclusion Criteria

- Multiple pregnancy
- Congenital fetal anomalies
- Severe pre-eclampsia
- Placental abruption
- Medical disorders contraindicating aspirin use

Sample Size

A total of 64 patients were included, with 32 patients in each group.

Management Protocol

Group A received oral aspirin 75 mg once daily.

Group B received oral aspirin 75 mg once daily along with oral L-arginine 3 g daily.

Treatment was continued until delivery or clinical indication for termination of pregnancy.

Outcome Measures

Primary outcome: Improvement in amniotic fluid index.

Secondary outcomes: Birth weight, gestational age at delivery, Doppler changes, and neonatal outcomes.

Statistical Analysis

Data were analyzed using SPSS version 21. Continuous variables were expressed as mean $\pm$ standard deviation. A p value < 0.05 was considered statistically significant.

RESULTS

Table 1: Distribution of age among study participants (n=64)

	Group A, n(%)	Group B, n(%)	Chi square value & p value
18-24	14 (43.75)	8 (25)	3.34 0.18 (ns)
25-31	13 (40.63)	14 (43.75)	
32-38	5 (15.63)	10 (31.25)	
Total	32 (100)	32 (100)	

Table 2: Baseline Characteristics

Parameter	Group A (Aspirin)	Group B (Aspirin + L-arginine)
Mean age (years)	25.75 $\bar{A} \pm 3.99$	28.34 $\bar{A} \pm 4.85$
Mean gestational age (weeks)	Comparable	Comparable

Table 3: Distribution of parity among both groups (n=64)

Gestational age	Group	Gravida	Primi	Total
			≥ 2 gravida	

28 – 31+6 weeks	Group A	2 (33.33%) (4.65%)	4 (66.67%) (19.05)	6
	Group B	3 (60%) (6.98%)	2 (40%) (9.53)	5
32 – 36 weeks	Group A	18 (69.23%) (41.86)	8 (30.77) (38.09)	26
	Group B	20 (74.07) (46.51)	7 (25.93) (33.33)	17
Total		43	21	64

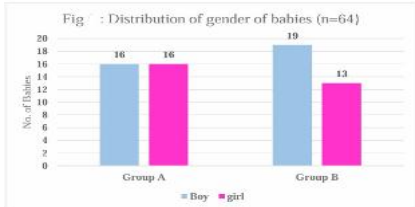


Table 4: Post-treatment Amniotic Fluid Index

Parameter	Group A	Group B
Mean AFI (cm)	8.53 $\bar{A}\pm$ 1.24	9.37 $\bar{A}\pm$ 1.00

Table 5: Birth Weight Comparison

Group	Mean Birth Weight (kg)	p value
Aspirin	2.08	
Aspirin + L-arginine	2.34	0.031

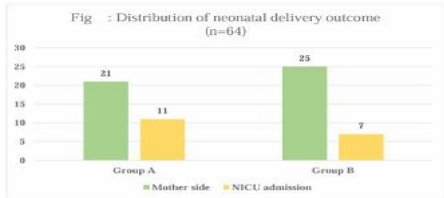
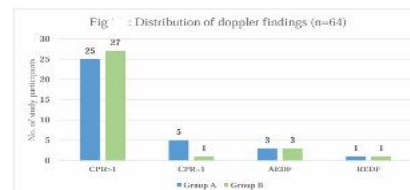


Table 6: Neonatal Outcomes

Outcome	Group A	Group B
NICU admission	34.37%	Reduced
Apgar score <7	Higher	Lower

Table 7: Distribution of Doppler findings among both groups (n=64)

Group	Doppler findings				
	CPR>1	CPR=1	AEDF	REDF	Total
Group A	31 (96.87)	0	0	1 (3.13)	32
Group B	31 (96.87)	0	0	1 (3.13)	32



DISCUSSION

The present study demonstrates that the combination of aspirin and L-arginine significantly improves amniotic fluid volume and fetal growth when compared to aspirin alone. L-Arginine supplementation has been shown to enhance placental and fetal hemodynamics and subsequently raise the generation of amniotic fluid, which not only increases fetal growth but also lessens the negative effects of oligohydramnios, resulting in increased fetal growth and improved pregnancy outcomes, particularly in cases where placental blood flow is compromised. Aspirin administration is based on its ability to inhibit platelet aggregation, thereby reducing microthrombi formation in the placental vasculature and improving uteroplacental perfusion. The combination of aspirin and L-arginine may offer synergistic benefits by targeting distinct but complementary pathways involved in placental and fetal physiology. While aspirin primarily acts on platelet function and microvascular integrity, L-arginine

supports vasodilation and nutrient transport through NO-mediated mechanisms. The observed improvement in amniotic fluid index reflects enhanced uteroplacental perfusion mediated by nitric oxide-dependent vasodilatation. Similar findings have been reported in previous studies evaluating the role of amino acid supplementation in placental insufficiency. Improved birth weight and reduced NICU admissions further support the benefit of combination therapy in improving perinatal outcomes. Both groups displayed a slight variation in AFI values of 6 to 9 cm at 28–31+6 weeks. AFI values were marginally higher in Group B, nevertheless, as none of the subjects had an AFI lower than 6 cm. Conversely, a greater percentage of participants in Group A were in the lower AFI ranges, specifically 6 and 7 cm, indicating a less positive reaction to intervention at younger gestational ages. The results shows a wider range of AFI levels in both groups at 32–36 weeks. Participants in Group A were more scattered, with higher AFI occurrences at 6 cm, whereas Group B once more displayed a mid-range concentration (7–8 cm). This could suggest a more consistent and successful reaction to combination treatment. Participants in Group A mainly experienced a 1 cm rise or no change, but Group B documented more frequent increases of 2 cm or more in women between 28 and 31+6 weeks of gestation. This pattern lends credence to the idea that L-arginine improves uteroplacental circulation through vasodilatory actions, which may be the reason why it augments fluid restoration more regularly. These findings not only measure the therapeutic efficacy of L-arginine supplementation, but they also imply that its advantages may be higher in later stages of pregnancy when placental function is more important for fluid dynamics. Compared to Group A, a greater percentage of participants achieved a 2–3cm improvement, particularly among those with an initial AFI of 6 and 7 cm. Even in those who started with lower AFI levels, this continuous pattern points to the synergistic advantage of L-arginine in improving uteroplacental circulation and encouraging fluid restoration.

CONCLUSION

Aspirin combined with L-arginine is more effective than aspirin alone in improving amniotic fluid index, fetal growth, and neonatal outcomes in pregnancies complicated by oligohydramnios with fetal growth restriction.

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