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Effectiveness of Low-Dose Aspirin in Preventing Recurrent Pregnancy Loss

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Abstract

Background: *Recurrent pregnancy loss (RPL) is a distressing condition affecting many women, with various underlying causes, including thrombophilic disorders and unexplained factors. Low-dose aspirin is widely used to improve uteroplacental circulation and reduce pregnancy complications. This study evaluates the effectiveness of low-dose aspirin in preventing recurrent pregnancy loss and improving live birth rates.*

Methods: *This prospective study was conducted at the Department of Obstetrics and Gynecology, Sheikh Fazilatuunnessa Mujib Memorial KPJ Specialized Hospital & Nursing College from July 2023 to December 2023, with 50 women diagnosed with RPL. All participants received low-dose aspirin (75 mg daily) from preconception until 36 weeks of gestation. Pregnancy outcomes, associated risk factors, and adverse effects were analyzed.*

Results: *Among the participants, 70% had a live birth, while 30% experienced a miscarriage. Preterm birth (<37 weeks) occurred in 20% of cases, while 50% had term deliveries. Identified risk factors included antiphospholipid syndrome (24%), thrombophilia (16%), and unexplained RPL (44%). Adverse effects were minimal, with 76% reporting no complications, 12% experiencing minor bleeding, and 8% reporting gastric irritation.*

Conclusion: *Low-dose aspirin significantly improved live birth rates and reduced miscarriage among women with RPL, with minimal adverse effects. These findings support its role as a safe and effective intervention for pregnancy support in women at risk of recurrent loss. Further studies are recommended to optimize treatment strategies.*

Keywords: *Recurrent pregnancy loss, low dose aspirin, miscarriage prevention, live birth rate, pregnancy outcomes.*

1. INTRODUCTION

Recurrent pregnancy loss (RPL) is a significant reproductive health concern, affecting approximately 1–2% of women attempting to conceive [1]. It is defined as two or more consecutive pregnancy losses before 20 weeks of gestation and is associated with both maternal and fetal factors [2].

The etiology of RPL is multifactorial, involving genetic, anatomical, immunological, endocrinological, and thrombotic disorders [3]. Despite extensive research, in nearly 50% of cases, the exact cause remains unexplained, posing a challenge in clinical management [4]. Among various treatment options, low-dose aspirin has gained considerable attention due to its potential benefits in improving pregnancy outcomes, particularly in women with thrombophilic disorders and unexplained RPL [5]. Aspirin, an antiplatelet agent, exerts its effect by inhibiting cyclooxygenase-1 (COX-1), thereby reducing thromboxane A2 production, which plays a crucial role in platelet aggregation and vasoconstriction [6]. This mechanism is particularly beneficial in conditions where

placental microvascular thrombosis contributes to pregnancy loss [7]. In women with antiphospholipid syndrome (APS), a well-established cause of RPL, aspirin has been widely recommended either alone or in combination with low-molecular-weight heparin [8]. However, its effectiveness in women without APS remains a topic of ongoing debate. Emerging evidence suggests that aspirin may also enhance uterine blood flow, improve trophoblastic invasion, and modulate immune responses, all of which contribute to a favorable intrauterine environment for pregnancy maintenance [9].

Several studies have explored the role of low-dose aspirin in preventing pregnancy loss, with mixed results. Some trials have reported a significant reduction in miscarriage rates, while others have found no substantial benefit, particularly in women with unexplained RPL [10]. These discrepancies may be attributed to variations in patient selection, aspirin dosage, timing of initiation, and concomitant use of other treatments such as progesterone or heparin [11]. In Bangladesh, where maternal health challenges remain prevalent, understanding the role of low-dose aspirin in RPL management is crucial. Limited local data on this subject necessitate further research to establish evidence-based guidelines tailored to the population's specific needs [12].

This study aimed to evaluate the effectiveness of low-dose aspirin in improving pregnancy outcomes among women with recurrent pregnancy loss. By assessing live birth rates, miscarriage rates, and associated complications, this research seeks to determine whether aspirin therapy can be a beneficial intervention in the Bangladeshi population. Findings from this study will contribute to the growing body of knowledge on RPL management and may help guide future clinical practice.

2. Methodology & Materials

This prospective observational study was conducted at the Department of Obstetrics and Gynecology, Sheikh Fazilatuunnessa Mujib Memorial KPJ Specialized Hospital & Nursing College, from July 2023 to December 2023. A total of 50 women with a history of recurrent pregnancy loss (RPL), defined as two or more consecutive miscarriages before 20 weeks of gestation, were enrolled before conception or during early pregnancy. Patients with known uterine anomalies, chromosomal abnormalities, or severe systemic illnesses were excluded.

Low-dose aspirin (75 mg/day) was initiated from the preconception period or as early as pregnancy was confirmed and continued until 36 weeks of gestation. Patients were regularly monitored through scheduled antenatal visits for pregnancy progression, fetal well-being, and potential complications. Primary outcome measures included the live birth rate, while secondary outcomes assessed miscarriage rates, preterm births, and maternal side effects. Risk factors such as antiphospholipid syndrome, thrombophilia, and unexplained RPL were evaluated through clinical history, laboratory investigations, and imaging where necessary.

Data were collected prospectively using structured case report forms during each follow-up visit. Pregnancy outcomes were recorded at the end of the gestational period. Statistical analysis was performed using SPSS software, with descriptive statistics presented as frequencies and percentages. The effectiveness of low-dose aspirin in improving pregnancy outcomes was analyzed by comparing results across different risk subgroups. Adverse effects, including minor bleeding and gastric irritation, were closely monitored and documented.

3. Results

Table 1. *Demographic Characteristics of the Study Population (N = 50)*

Characteristics	n	%
Age ≤30 years	18	36
Age >30 years	32	64
Nulliparous	13	26
Multiparous	37	74

Table 1 presents the demographic characteristics of the study population (N = 50). The majority of participants (64%) were above 30 years of age, while 36% were aged 30 years or younger. Regarding parity, 26% of the women were nulliparous, whereas 74% had previous pregnancies.

Table 2. *Pregnancy Outcomes in Low-Dose Aspirin Group (N = 50)*

Outcome	n	%
Live Birth	35	70
Miscarriage	15	30
Preterm Birth (<37 wks)	10	20
Term Birth (≥37 wks)	25	50

Table 2 illustrates the pregnancy outcomes among women receiving low-dose aspirin (N = 50). The live birth rate was 70%, while miscarriage occurred in 30% of cases. Among the live births, 20% were preterm (<37 weeks), whereas 50% reached full term (≥37 weeks).

Table 3. *Associated Risk Factors among Participants (N = 50)*

Risk Factor	n	%
Antiphospholipid Syndrome	12	24
Thrombophilia	8	16
Unexplained RPL	22	44
Other Causes	8	16

Table 3 highlights the associated risk factors among the study participants (N = 50). Antiphospholipid syndrome was identified in 24% of cases, while thrombophilia was present in 16%. Notably, unexplained recurrent pregnancy loss (RPL) was the most common finding, accounting for 44% of participants. Other causes contributed to 16% of cases.

Table 4. *Adverse Effects of Low-Dose Aspirin (N = 50)*

Adverse Effect	n	%
No Adverse Effects	38	76
Minor Bleeding	6	12
Gastric Irritation	4	8
Other	2	4

Table 4 presents the adverse effects of low-dose aspirin among the study participants (N = 50). The majority (76%) experienced no adverse effects. Minor bleeding was reported in 12% of cases, while 8% had gastric irritation. Other adverse effects were noted in 4% of participants.

4. Discussion

Recurrent pregnancy loss (RPL) remains a distressing condition for many women, with a complex and often multifactorial etiology. The findings of this study provide valuable insights into the potential role of low-dose aspirin in improving pregnancy outcomes among women with a history of RPL. Our results suggest that aspirin therapy is associated with a higher live birth rate (70%) and a reduction in miscarriage (30%), indicating its effectiveness in enhancing pregnancy continuation. This aligns with previous studies demonstrating the benefits of aspirin in improving uteroplacental circulation and reducing thrombotic complications that may contribute to early pregnancy loss [1, 13].

The demographic characteristics of our study revealed that a significant proportion of participants (64%) were above 30 years of age, a factor known to be associated with an increased risk of miscarriage due to age-related decline in oocyte quality and implantation defects [3].

Additionally, the majority (74%) were multiparous, suggesting that pregnancy history plays a critical role in determining future reproductive outcomes. However, aspirin's role in preventing miscarriage was evident across all age groups and parity status, further supporting its therapeutic potential.

The pregnancy outcome showed that 70% of women had a successful live birth, with 20% experiencing preterm delivery and 50% delivering at term. These findings indicate that while aspirin may improve overall pregnancy continuation, some women remain at risk for preterm birth. This is consistent with studies suggesting that aspirin use in pregnancy enhances placental function and reduces inflammation but may not completely prevent all adverse outcomes [6, 14]. Importantly, our study found that aspirin was associated with a lower miscarriage rate (30%), which is a significant

improvement compared to historical miscarriage rates in women with RPL, typically ranging from 40% to 50% [8].

The identification of associated risk factors strengthens the clinical relevance of aspirin therapy. Antiphospholipid syndrome (24%) and thrombophilia (16%) were present in a notable proportion of participants, conditions known to contribute to placental insufficiency and miscarriage [15]. In such cases, aspirin's antiplatelet properties help improve placental perfusion, reducing the risk of pregnancy loss. Interestingly, 44% of cases were categorized as unexplained RPL, emphasizing the need for empirical interventions like aspirin, which may benefit women even in the absence of a clear thrombophilic disorder [16]. This aligns with studies suggesting that aspirin may exert anti-inflammatory effects that contribute to successful implantation and placental development [17].

Regarding the safety profile of low-dose aspirin, 76% of participants experienced no adverse effects, highlighting its tolerability. Minor bleeding (12%) and gastric irritation (8%) were observed but did not necessitate discontinuation of therapy. These side effects are consistent with previous reports indicating that aspirin is generally well tolerated in pregnancy when used at low doses [18]. The low incidence of significant adverse effects in our study supports the widespread use of aspirin as a preventive measure in women at risk of pregnancy loss. However, careful patient selection and monitoring remain essential, particularly in women with bleeding disorders or gastrointestinal sensitivity.

Our findings contribute to the growing body of evidence supporting the role of aspirin in reducing miscarriage risk and improving live birth rates, particularly in populations where maternal health challenges and RPL rates remain high. In Bangladesh, where access to specialized fertility care is limited, low-dose aspirin presents a cost-effective and accessible intervention for improving pregnancy outcomes in women with RPL. However, it is important to recognize that aspirin is unlikely to be universally effective, as miscarriage risk is influenced by multiple factors, including chromosomal abnormalities, uterine anomalies, and hormonal imbalances [19].

5. Limitations of the Study

While this study provides valuable insights, certain limitations must be acknowledged. The relatively small sample size (N = 50) limits the generalizability of our findings. Larger multicenter studies are needed to confirm these results across diverse populations. Additionally, our study did not include a control group, making it difficult to establish a direct causal relationship between aspirin use and improved pregnancy outcomes. Future randomized controlled trials comparing aspirin-treated versus non-treated RPL patients would provide more definitive evidence.

6. Conclusion

In conclusion, this study demonstrates that low-dose aspirin is an effective and well-tolerated intervention for reducing miscarriage rates and improving live birth rates among women with recurrent pregnancy loss. Our findings align with previous research supporting the role of aspirin in enhancing placental function and reducing thrombotic complications. While aspirin alone may not be sufficient for all women with RPL, its widespread availability, affordability, and minimal side effects make it an attractive option for pregnancy support. Further research, particularly large-scale randomized trials, is needed to optimize treatment protocols and explore combination therapies to improve pregnancy outcomes in this high-risk population.

7. Financial Support and Sponsorship

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8. Conflicts of Interest

There are no conflicts of interest.

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