

The Difference in Clotting Risks Between Cesarean and Vaginal Deliveries

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Introduction

Pregnancy-associated Venous Thromboembolism (VTE), manifested as either Deep Vein Thrombosis (DVT) or Pulmonary Embolism (PE), is an important cause of obstetric morbidity and mortality. While pregnancy itself creates a natural increase in clotting ability to protect against excessive bleeding, it can also raise the risk of dangerous conditions such as VTE. Each year, thousands of females worldwide experience preventable complications related to blood clots after childbirth. Vaginal delivery (VD) and cesarean section (CS) differ significantly in their physical impact on the body, particularly because CS is a major surgical procedure and carries a 4-fold increased risk of blood clots in the postpartum period, compared with VD (Figure 1).

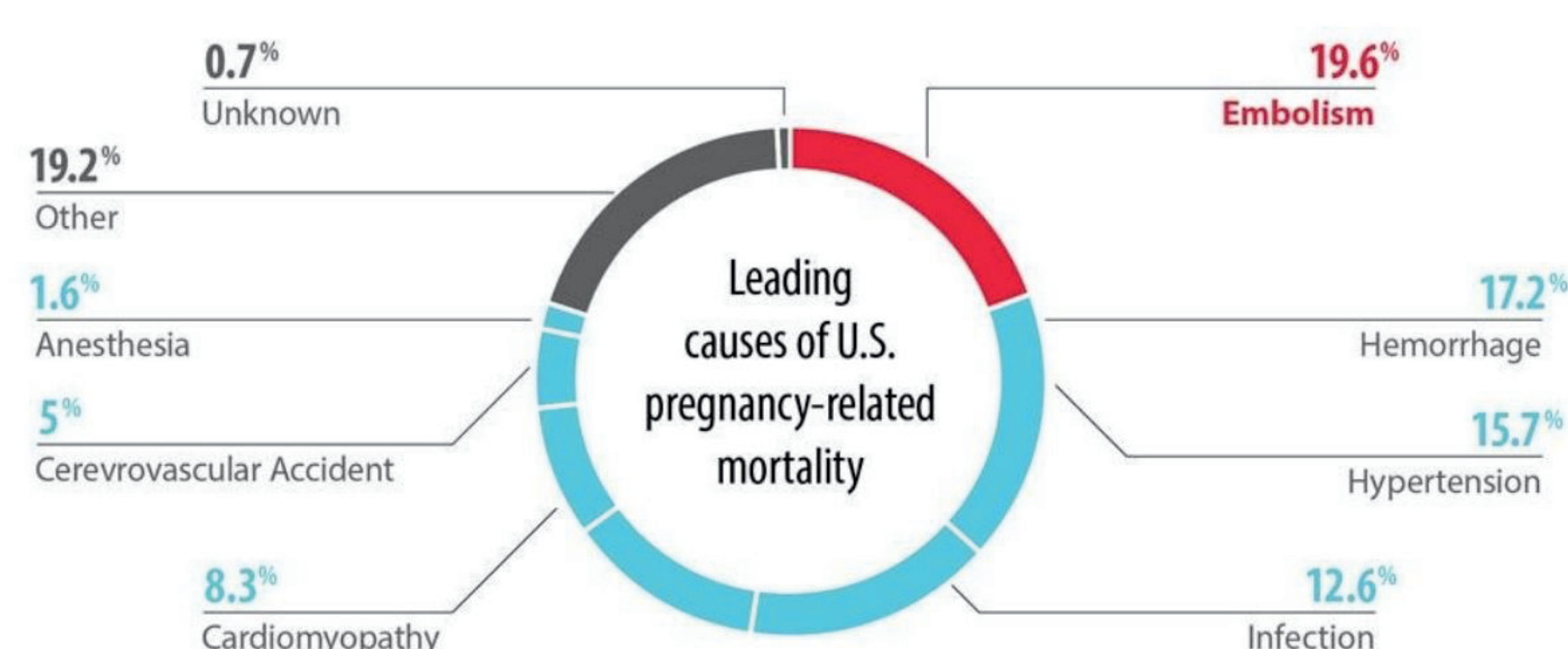


Figure 1: Leading causes of US pregnancy-related mortality

Methods

Both CS and VD (Figure 2) have a risk of thrombosis.

Methods:

- Compared the incidence of thrombosis between these two delivery methods
- Conducted a literature review, analyzing findings from multiple large-scale studies and clinical data
- Studies examining postpartum thrombotic effects were reviewed to determine whether one delivery method is associated with a significantly greater risk than the other.

By comparing these two delivery methods, we aimed to highlight key differences in clotting risk and their implications for patient care, particularly in prevention and monitoring. Finally, we reviewed various preventive measures for VTE following CS.

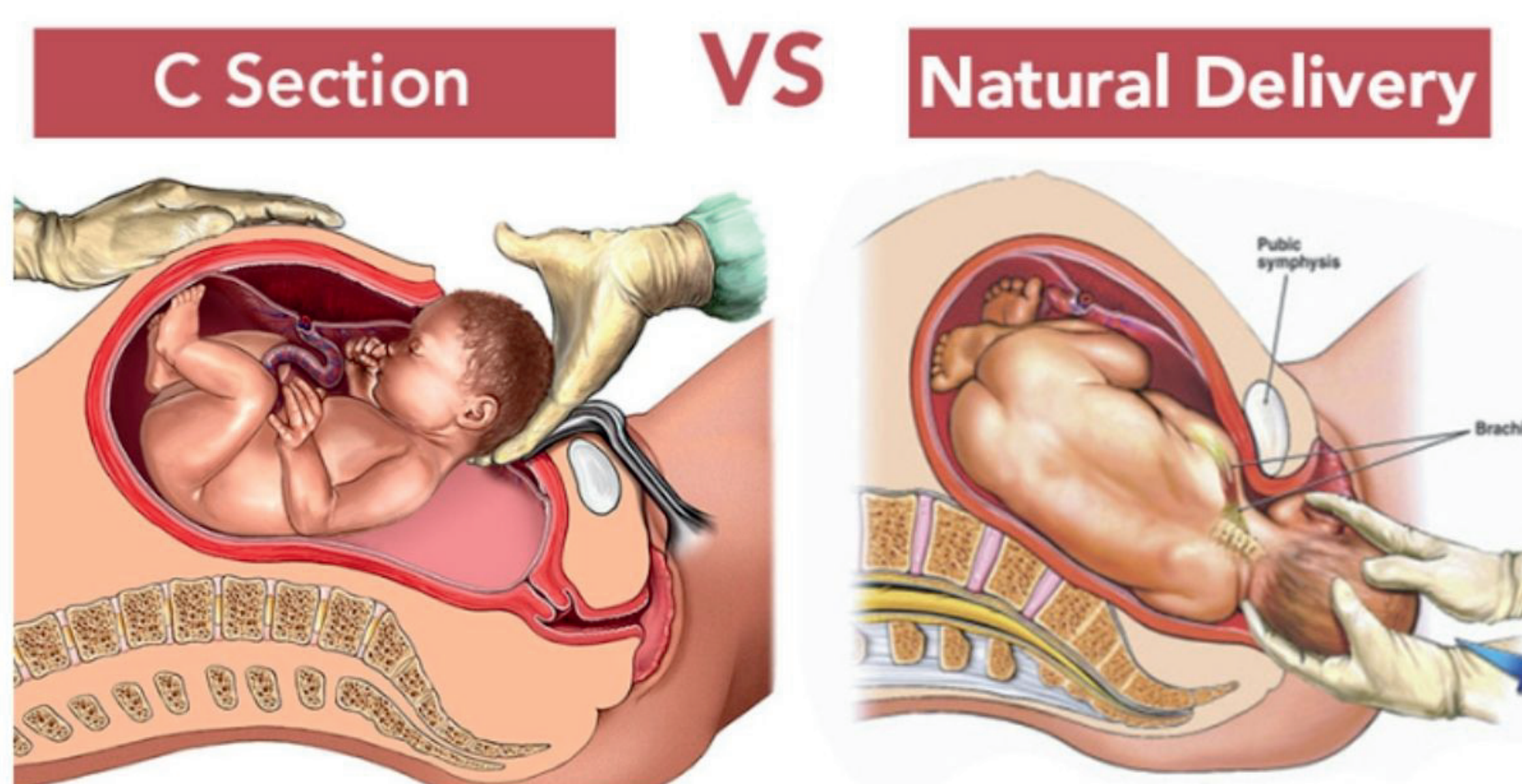


Figure 2: Diagram comparing C-section vs Natural (Vaginal) Delivery

Results

Many large studies have demonstrated that CS is associated with a significantly higher risk of developing VTE than VD. Although the overall occurrence of blood clots is relatively rare, the risk should never be overlooked. The data shown conveys that the comparison between modes of delivery is clinically meaningful (Figure 3). Significantly, the highest risk period is postpartum, six weeks for VTE. This creates a critical window for monitoring and implementing prevention strategies, especially for patients at higher risk. These findings underscore the importance of identifying patients at risk of thrombotic complications post-delivery. Implementing prevention strategies early can reduce the likelihood of VTE.

Comparison of the risks of blood clots between cesarean and vaginal deliveries (Figure 3)

Factor	Cesarean Delivery (C-section)	Vaginal Delivery
Overall VTE Risk	Higher (= 2-4x greater than vaginal)	Lower baseline risk
Absolute Risk	~0.5-2 per 1,000 deliveries	~0.2-0.5 per 1,000 deliveries
Surgical Factors	Major surgery → increased clotting response	No surgery → less coagulation activation
Immobility	Longer recovery → more immobility	Earlier ambulation
Endothelial Injury	Greater tissue and vessel injury	Minimal vessel trauma
Inflammation	Higher inflammatory response	Lower inflammatory response
Anesthesia Effects	Can contribute to venous stasis	Minimal impact
Postpartum Recovery Time	Longer (days-weeks)	Shorter (hours-days)
Need for Thromboprophylaxis	More commonly recommended (e.g., heparin, compression devices)	Usually not needed unless high-risk
Compounding Risk Factors	Obesity, emergency C-section, infection further increase risk	Risk increases mainly with underlying conditions

Types of CS:

- Planned (elective) CS is scheduled in advance, after 39 weeks of pregnancy, in cases such as placenta previa, severe preeclampsia, or risk of uterine rupture.
- Emergency C-section. When a VD was planned but for medical reasons, it was decided that a CS is the safer option in cases of fetal distress, such as abnormal heart rhythms, acute hypoxia or asphyxia, severe preeclampsia or eclampsia, umbilical cord prolapse, or when labor progress is stalled with ineffective cervical dilation or fetal descent.

Incidence of Venous Thromboembolism (VTE) by Delivery Method

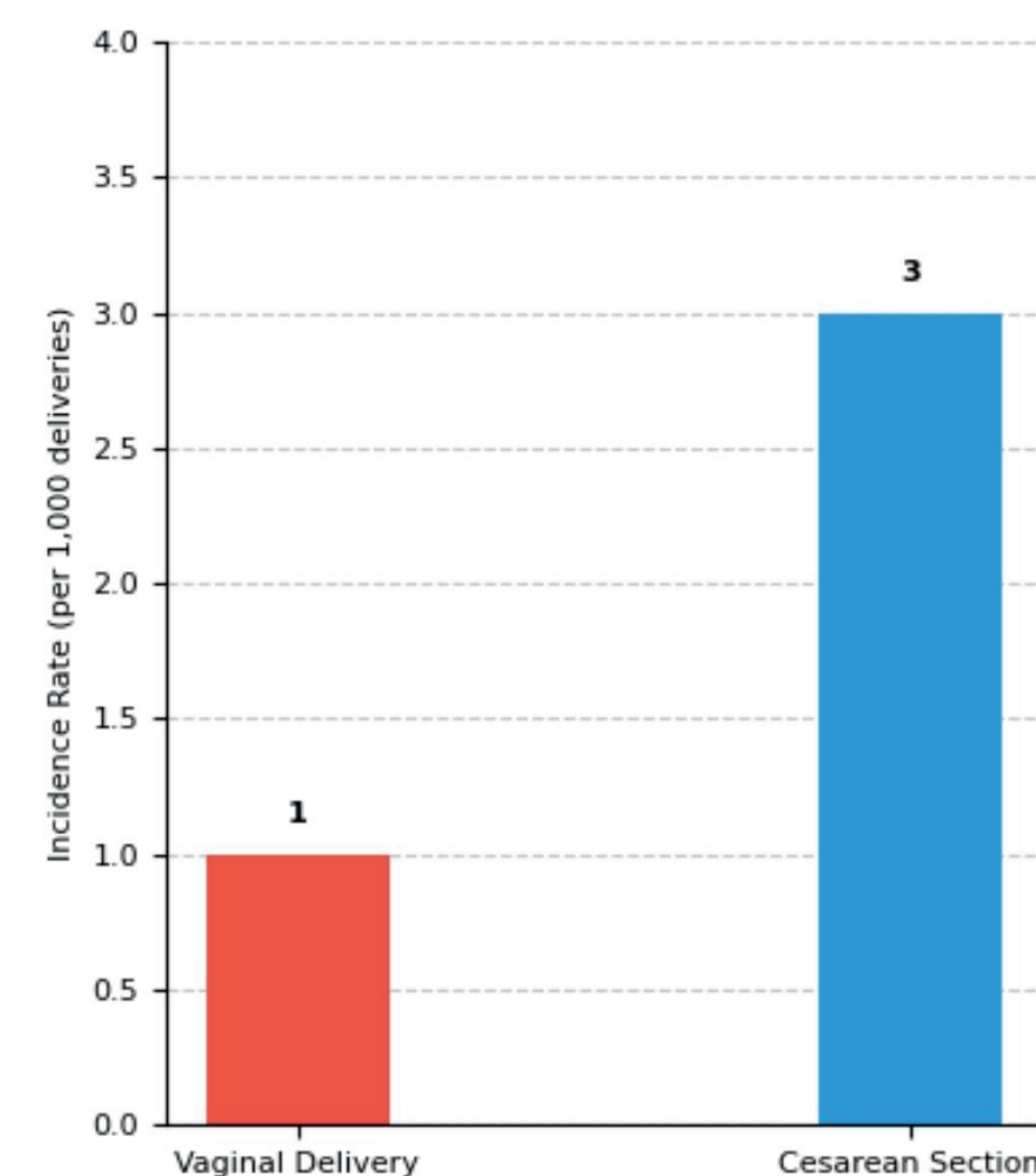


Figure 4: Comparison of VTE Incidence by delivery method

Overall, the data consistently show that cesarean delivery is associated with a significantly higher risk of postpartum clotting events. (The bar graph illustrates the higher rate of VTE in females following a C-section compared to those who delivered vaginally)

There are effective prevention strategies such as early mobilization, compression devices, and anticoagulant medications for high-risk patients.

- Appropriate use of thromboprophylaxis and sequential compression devices.
- Medical interventions such as early mobilization, compression devices, and anticoagulant medications.

These measures can help ensure safer and more effective cesarean sections while minimizing risks to both the mother and the newborn.

Conclusion

- Both CS and VD happen during a naturally high-risk time for clotting but CS clearly carries a greater risk.
- Although the overall incidence of clotting events with VD remains relatively low, the relative risk increases significantly following a cesarean section due to surgical trauma, and inflammation.
- Increasing awareness—both among clinicians and patients—is the key to reducing complications.
- More research can help refine guidelines, so we can continue improving maternal care and outcomes.

At the end of the day, the goal is simple: safer pregnancies and healthier recoveries.