

Outcome of Pregnancy Complicated by Infective Endocarditis: A Review of Published Literature over Past Three Decades

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Abstract

Background - Infective endocarditis (IE) is a rare complication during pregnancy but it associates with high maternal and foetal mortality. Our aim was to study maternal and foetal outcomes in published cases of IE during pregnancy.

Method – A PubMed literature survey was done using “pregnant” “pregnancy” and “endocarditis” as the key words. All case reports published between 1981 and 2010 in English language were reviewed to study patient demography, causative organisms, pre disposing factors, methods of treatment and clinical outcomes.

Results - A total of 41 case reports (43 pregnant women with IE) were reviewed. Mean age was 28 (± 4.75) years. IE was diagnosed in their first, second and third trimesters in 5%, 31%, and 43% respectively while 21% of the cases were diagnosed during postnatal period. Prior history of valve disease was known in 30%. Commonest causative organisms were *Streptococcus* (51%) and *Staphylococcus* (29%) species. Mitral, aortic, tricuspid valves were involved in 53%, 33% and 25% cases respectively. Valve replacement surgery was done in 50% patients (18% before delivery). Maternal mortality was 9.30%. Foetal mortality was 7% (all were due to abortions). Maternal complication rate was 79% [most common complications included thromboembolism in 21%, septic embolism in 23%, cardiac failure in 21%, obstetric complications in 16% and nosocomial infections in 7%].

Conclusion - Pregnancy complicated by IE is associated with significant morbidity and mortality for both mother and foetus. Extreme care is necessary for pregnant women who were diagnosed with IE and should be managed in a tertiary centre with multidisciplinary specialist care.

Keywords: “Pregnancy” “endocarditis”

I. INTRODUCTION

Heart disease is one of the most important complications during pregnancy and is responsible for 10-15% of maternal mortality (Montoya, et al., 2003). Infective endocarditis (IE) during pregnancy is rare - the incidence has been estimated to be 0.006 % (ESC guidelines, 2009). However, this is a potentially lethal complication. The maternal mortality rate can reach to 33% - (Montoya, et al., 2003) with most deaths related to either heart failure or an embolic event. The rate of foetal mortality is also high – up to 29% (Montoya, et al., 2003).

Our aim was to study the risk factors and maternal and foetal outcome in cases of IE during pregnancy.

II. METHOD

A literature survey was done in PubMed using “pregnant” or “pregnancy” and “endocarditis” as key words. All the case reports published between 1981 and 2010 in English language were reviewed to find patient demography, causative organisms, pre-disposing factors, methods of treatment and clinical outcomes.

III. RESULTS

A total of 41 case reports with 43 cases of IE in pregnancy were reviewed. Mean age of the patients was 28 (± 4.75) years. IE was diagnosed in 5% in their 1st trimester, 31% in the 2nd and 43% in the 3rd trimesters respectively while another 21% of the cases were diagnosed during postnatal period with 5 cases following abortions. The number of mothers diagnosed in 2nd and 3rd trimesters remains the highest and diagnosis of IE during postnatal period is also an important observation (Figure 1).

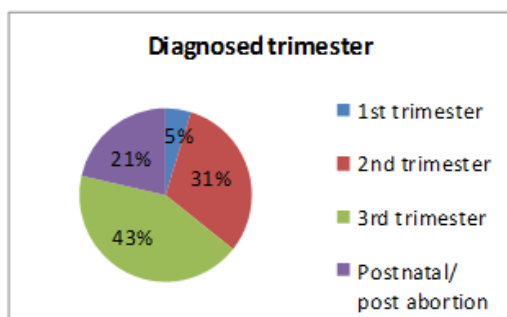


Figure 1: Diagnosed trimester

Prior history of cardiac pathology was known in 30% out of which rheumatic heart disease amounts for 62%, VSD 15% and PDA 8%. Among the other predisposing factors, history of IV drug abuse was present in 14% and 5% presented with history of previous prosthetic valve insertion. Nearly half of the cases had no reported history of pre disposing factors (Table 1).

Table 1: Pre disposing factors

	Pre disposing factor	No. (%) of cases
1	H/O IV drug abuse	6 (14)
2	Underlying cardiac pathology	13(30)
	Rheumatic heart disease	8 (62)
	VSD	2 (15)
	PDA	1(8)
	Other valvular defects	2 (15)
3	Prosthetic valve	2 (5)
4	H/O dental surgery	1 (2.27)
5	None	22 (50)
	Total	44

The commonest causative organisms according to species were *Streptococcus* and *Staphylococcus* species with 51% and 29% respectively. Infection with *Streptococcus viridians* was 31% and MRSA was 9%. 11% were gram negative cases including infections with *Neisseria gonorrhoeae*, *Salmonella typhi*, *Haemophilus parainfluenzae* and *Enterobacter*. Three culture negative cases(8.6%) and two cases with multiple infections were also reported (Table 2).

Table 2: Causative organisms

Organism	Percentage (%)
Beta haemolytic streptococci	2.3
Enterobacter cloacae	2.9
Enterococcus	5.7
Gram positive cocci	5.7
Group B streptococcus	8.6
Haemophilus parainfluenzae	2.9
Neisseria gonorrhoeae	2.9
Salmonella typhi	2.9
Staphylococcus aureus (MRSA)	8.6
Staphylococcus aureus (MSSA)	20
Streptococcus viridans	31
Other streptococcus spp.	2.9
Culture negative	8.6

(MRSA: Methicillin resistant *Staphylococcus aureus*, MSSA: Methicillin sensitive *Staphylococcus aureus*)

Valve involvement was mitral valve 53%, aortic valve 33%, tricuspid 25% and pulmonary 2.8%. Involvement of two valves was present in 14% cases.

The mode of delivery was vaginal in 45% and caesarean section in 31% cases (not mentioned in 24%). Premature delivery rate was 14%.

Valve replacement surgery was done in 50% of the patients. 18% were done before delivery and 82% were done after. In all the cases with delivery by caesarean section, the valve replacement surgery was done soon after the delivery.

Foetal mortality was 7%. All were due to abortions/miscarriages and no cases of still births and post natal deaths were reported in this review.

The maternal mortality rate was 9.30%. Despite different methods of treatment, the rate of maternal complications also remained high in the reviewed IE cases.

Table 3: Maternal complications

	Complication	No of cases (%)
1	Thromboembolism	9 (21)
a	Stroke	1 (2.3)
b	Pulmonary embolism	3 (7)
c	Peripheral embolism	5 (12)
2	Septic embolism	10 (23)
3	Cardiac complications	10 (23)
a	Cardiac failure	9 (21)
b	Myocardial Infarction	1 (2.3)
4	Intracranial Haemorrhage	1 (2.3)
5	Obstetric complications	7 (16)
a	Premature rupture of membrane	1 (2.3)
b	PPH	2 (4.6)
c	Placental Abruption	1 (2.3)
d	Post abortive endometritis	2 (4.6)
6	Nosocomial infections	3 (7)
7	Deep vein thrombosis	1 (2.32)
8	Multisystem failure	1 (2.32)

Table 4: Maternal complications by three decades

Maternal complications	1981-1990	1991-2000	2001-2010
Thromboembolism	1(2.32)	2(4.65)	6(13.9)
Septic embolism	4(9.30)	-	6(13.9)
Cardiac complications	5(11.62)	3(6.97)	2(4.65)
Intracranial Hemorrhage	-	1(2.32)	-
Obstetric Complications	2(4.65)	2(4.65)	2(4.65)
Nosocomial infections	-	-	3(6.97)
Deep vein thrombosis	-	-	1(2.32)
Multisystem failure	-	-	1(2.32)

The maternal complication rate was 79%. Most common complications were thromboembolism in 21%, septic embolism in 23%, cardiac failure in 21%, obstetric complications in 16%, intracranial haemorrhage in 2.3%, nosocomial infections in 7%, deep vein thrombosis in 2.3% and multi organ failure in 2.3% of the patients.

In a meta analysis, maternal complications were sorted by three decades (1981-1990, 1991-2000, 2001-2010). (Table 4)

There was a significant increase in the rates of Thromboembolism and septic embolism in last ten years. Cardiac complications were reduced in 2001-2010, when compared to 1981-1990 and 1991-2000. Nosocomial infections, Deep vein thrombosis, Multisystem failure were not reported in 1981-2000. But, 6.97%, 2.32%, 2.32% were reported in the year 2001-2010 respectively.

IV. DISCUSSION

IE is a rare condition to associate with pregnancy, However, it needs prompt diagnosis and early and effective treatment due to the risk of complications that affects maternal and foetal outcomes. Despite the number of different treatment modalities, IE in pregnancy results in high mortality and morbidity rates for both the mother and foetus.

The findings in this review show that the 3rd trimester is the most prone period to acquire this infection. Interestingly, there was a significant number of cases with IE during postnatal period, which also included a number of cases following abortions. Therefore special care should be taken to prevent IE following delivery as well.

The commonest causative organism is *Streptococcus viridans*. The *Staphylococcus aureus* infection and infections with Gram negative organisms were also high. Few cases were also reported to be culture negative. Therefore it was observed that both common and uncommon organisms could cause IE during pregnancy.

All the cases were managed promptly following diagnosis where half of the cases were managed conservatively without surgery. These patients were treated only by administration of intravenous antibiotics and the rest underwent valve replacement surgery in addition to the antibiotic therapy. The patients who underwent valve replacement surgery had good long-term prognosis despite the high risk of complications. Majority of the patients (nearly 80%) had valve replacement surgery after the delivery as many of the clinicians who treated these patients thought that this is the safest strategy for both the mother and the foetus.

The complication rates remained high in patients with IE during pregnancy. Thromboembolism, septic embolism and cardiac failure were the most common complications. Few cases were also

reported having post abortive endometritis, which shows a risk of developing IE as a result of concurrent gynaecological infection. Despite the high morbidity rates, the mortality rate of mothers was lower (9%) compared to the previously published data (ESC guidelines, 2009). Foetal mortality and morbidity were also lower, where all the foetal losses were due to abortions.

V. CONCLUSION

Pregnancy complicated by IE is associated with high morbidity and mortality for both mother and foetus. These patients should be treated with extreme care and prompt diagnosis and early and effective management is necessary by a multidisciplinary team in a tertiary care centre to minimise complications and improve maternal and foetal outcomes.

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