

# MATERNAL AND FETAL OUTCOMES OF DENGUE INFECTION DURING PREGNANCY

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**Abstract.** Thirteen pregnant women with dengue infection were admitted to Ban Pong Hospital, Ratchaburi and Photharam Hospitals, Ratchaburi, Thailand during 2007-2015. The diagnosis of dengue disease in these pregnant women adhered to clinical and laboratory criteria for the diagnosis of dengue disease as established by the World Health Organization (WHO) 1997. Our study showed dengue infection can happen in any pregnancy trimester with all severities of dengue disease, namely dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS). All were symptomatic, received supportive treatment, and had uneventful recovery. Eleven of 13 cases proceeded to normal delivery, but two cases proceeded to abortion. All 11 cases proceeding to labor delivered normal newborn remaining healthy up to the time of this report.

**Keywords:** dengue, pregnancy, fetus

## INTRODUCTION

The World Health Organization (WHO) has declared dengue the fastest-spreading mosquito-borne viral disease in the world (WHO, 2012). Four closely related dengue serotypes cause the disease, which ranges from asymptomatic infection to undifferentiated fever dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). DF causes fever, rash, muscle or joint pain, headache, and eye pain, and it is rarely fatal. DHF is characterized by increased vascular permeability leading to leakage of plasma and DSS (Thisyakorn and Thisyakorn, 2015).

A shift in age group of the dengue patients toward adulthood has been widely seen in Asia (Tantawichien, 2015). It also affects child bearing age and pregnant women (Khamim *et al*, 2015). In dengue endemic areas, many cases of dengue disease among pregnant women have been reported. Dengue infected pregnant patients have

higher risk of severe disease than non-pregnant patients. Dengue infection during pregnancy can increase risks of abortion, premature uterine contraction, intra-partum and post-partum hemorrhage, maternal death, fetal distress, low birth weight, or death of the fetus *in utero* that is associated with disease severity and gestational age (RCPT, 2015).

Obstetricians must be aware that dengue infection in pregnant women may occur and surgical procedures performed on patients with dengue disease may unmask dengue induced hemostatic defects resulting in unexpected hemorrhage that is difficult to control. It also has been reported that dengue infection was vertically transmitted to the fetus and led to dengue illness in the neonate (Thaithumyanon *et al*, 1994).

This study aimed to describe maternal and fetal outcomes of dengue infection during pregnancy.

## MATERIALS AND METHODS

A retrospective analysis of 13 pregnant women with dengue diseases admitted at Ban Pong Hospital, Ratchaburi and Photharam Hospital, Ratchaburi, Thailand during 2007-2015 was

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done. The diagnosis of dengue patients adhered to clinical and laboratory criteria for the diagnosis of dengue patients as established by the WHO (WHO, 1997). The analysis also included maternal and fetal outcomes at delivery and during various durations of follow-up.

### RESULTS

Thirteen pregnant women with dengue disease admitted to Ban Pong Hospital, Ratchaburi and Photharam Hospital, Ratchaburi, Thailand during 2007-2015.

There were five severe dengue cases with four DHF and one DSS. One of the DHF patients was in the first trimester of pregnancy and had spontaneous abortion while the other four were in the second trimester of pregnancy and proceeded to normal delivery.

Eight cases had DF, of which two were in the first trimester with one of those two in the first trimester having threatened abortion. Both of those first trimester DF cases proceeded to normal delivery. Two DF cases were in the second trimester with one spontaneous abortion and the other proceeding to normal delivery. Other 4 DF cases were in the third trimester of pregnancy and all proceeded to normal delivery (Table 1).

All 11 cases proceeding to normal labor delivered normal newborn babies and all of them remained healthy thereafter up to the time of this report (Table 2).

### DISCUSSION

Our study showed that dengue infection presented in all pregnancy trimesters. In an endemic area of dengue, dengue infection should be considered in a pregnant woman with fever. The clinical characteristics of dengue-infected pregnant women are the same as other dengue infected patients who usually present with fever, myalgia, nausea, and vomiting. Leukopenia and thrombocytopenia are also common findings. Those with DHF show a rising of hematocrit as seen in our study.

Table 1. Characteristics of dengue-infected pregnant women.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Age (years)	15	33	33	16	37	27	19	22	20	19	22	27	27
Diagnosis	DHF	DF	DF	DF	DF	DF	DF	DF	DHF	DSS	DHF	DF	DHF
Gestational age (weeks)	12	14	33	38	26	5	10	14	14	16	16	36	20
Duration of fever (days)	5	3	3	3	3	3	5	6	4	3	4	6	5
Nausea/Vomiting	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Myalgia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Petechiae	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No
Epistaxis	No	No	Yes	No	Yes	No	No	Yes	No	No	No	No	No
White blood cell	2,100	4,900	3,110	6,700	4,980	1,680	3,500	3,150	3,300	3,500	4,500	4,890	4,230
Platelet count	74,100	84,400	95,800	73,200	26,100	83,200	39,000	59,900	42,100	11,400	24,800	84,200	34,000

DF, dengue fever; DHF, dengue hemorrhagic fever; DSS, dengue shock syndrome.

Table 2. Fetal outcomes of dengue-infected pregnant women.

Case number	1	2	3	4	5	6	7	8	9	10	11	12	13
Gestational age at delivery, (weeks)	21	17	40	38	37	40	40	38	39	40	38	40	38
Fetal status at birth	Abortion	Abortion	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	LBW	Normal	Normal
Birth weight, (g)	-	-	3,560	2,750	2,650	2,710	2,950	3,240	2,740	3,090	2,340	2,700	3,400
Sex	-	-	Male	Female	Female	Female	Male	Female	Female	Male	Male	Female	Female
Period of follow up, (years)	-	-	7	5	4	4	3	6	9	7	4	1	5

LBW, low birth weight.

Special considerations for diagnosis of DHF in pregnant women include physiologic hemodilution in pregnancy, which may obscure hemoconcentration in DHF and a differential diagnosis of pregnancy-related conditions, especially HELLP (hemolysis, elevated liver enzymes, and thrombocytopenia) syndrome ( RCPT, 2015). All thirteen pregnant women with dengue disease in this study had uneventful recovery from dengue disease.

There is no specific dengue therapy and successful treatment, which is mainly supportive, depends on early recognition of the disease and careful monitoring for shock. (Thisyakorn and Thisyakorn, 2015). The 2009 WHO case classification which is a severity-based revised dengue classification for medical interventions has been implemented in many countries (WHO, 2009). The systematic literature review indicated that the 2009 WHO case classification has clear advantages for clinical use (Horstick and Ranzinger, 2015).

Dengue infection during pregnancy can increase risk of abortion, premature uterine contraction, intra-partum and post-partum hemorrhage, maternal death, fetal distress, low birth weight, or death of the fetus *in utero* that is associated with disease severity and gestational age (RCPT, 2015). As seen in our study, two cases had abortion: one in the first trimester of pregnancy and the other in the early second trimester of pregnancy. One of 11 dengue infected pregnant woman in this study who proceeded to labor delivered a low birth weight newborn.

In conclusion, this report emphasizes a shift in age group of the dengue patients toward adulthood which also affected child bearing age and pregnant women. Favorable outcomes can be obtained by early recognition of the disease and careful monitoring of shock. Dengue infection during pregnancy can increase risks of abortion, premature uterine contraction, intra-partum and post-partum hemorrhage, maternal death, fetal distress, low birth weight, or death of the fetus *in utero* that is associated with disease severity and gestational age.

## REFERENCES

- Khamim K, Khamim B, Pengsaa K. Dengue infection in pregnancy. *Southeast Asian J Trop Med Public Health* 2015; 46(suppl 1): 153-60.
- Horstick O, Ranzinger SR. Reporting progress on the use of the WHO 2009 dengue case classification: a review. *Southeast Asian J Trop Med Public Health* 2015; 46(suppl 1): 49-54.
- Royal College Physician of Thailand (RCPT). Practical guideline for management of dengue in adults: 2014. *Southeast Asian J Trop Med Public Health* 2015; 46(suppl 1): 169-81.
- Tantawichien T. Dengue fever and dengue hemorrhagic fever in adults. *Southeast Asian J Trop Med Public Health* 2015; 46(suppl 1): 79-98.
- Thaithumyanon P, Thisyakorn U, Deerojnawong J, Innis BL. Dengue infection complicated by severe hemorrhage and vertical transmission in parturient woman. *Clin Infect Dis* 1994; 18: 248-9.
- Thisyakorn U, Thisyakorn C. Dengue: global threat. *Southeast Asian J Trop Med Public Health* 2015a; 46(suppl 1): 1-10.
- World Health Organization (WHO). Dengue haemorrhagic fever: diagnosis, treatment and control. 2<sup>nd</sup> ed. Geneva: WHO, 1997.
- World Health Organization (WHO). Dengue: guidelines for diagnosis, treatment, prevention and control. New edition. Geneva: WHO, 2009. [Cited 2017 Jan 29]. Available from : [http://www.who.int/tdr/publications/documents/dengue\\_diagnosis.pdf](http://www.who.int/tdr/publications/documents/dengue_diagnosis.pdf)
- World Health Organization (WHO). Global strategy for dengue prevention and control 2012-2020. Geneva: WHO, 2012. [Cited 2017 Jan 29]. Available from: [http://reliefweb.int/sites/reliefweb.int/files/resources/9789241504034\\_eng.pdf](http://reliefweb.int/sites/reliefweb.int/files/resources/9789241504034_eng.pdf)