ORIGINAL ARTICLE

Role of Early Induction of Labor in Improving Fetomaternal Outcome of Pregnancies Complicated by Hepatitis E Induced Fulminant Hepatic Failure

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ABSTRACT

Aim: To determine the fetomaternal outcome after early induction of labor in pregnant women with hepatitis E induced acute liver failure.
Design: This was a descriptive case series.
Methods: It was conducted at the Department of Obstetrics and Gynecology, Mayo Hospital Lahore over 2 years from January 2019 to December 2020. 40 consecutive pregnant women aged between 18-40 years presenting with fulminant hepatic failure due to hepatitis E infection during 3rd trimester of gestation were included after written informed consent. These patients were managed by early induction of labor. Fetomaternal outcome was noted in terms of need for cesarean delivery, postpartum hemorrhage, maternal death and intrauterine.
Results: In the present study, the mean age of the study participants was 25.5±4.4 years while the mean gestational age was 33.4±2.2 weeks. There were 11 (27.5%) primiparas and 29 (72.5%) multiparas. We observed that early induction of labor significantly improved fetomaternal outcome evident from decreased frequency of Cesarean delivery (30.0%), postpartum hemorrhage (7.5%), maternal death (17.5%) and intrauterine (10.0%) and early neonatal death (5.0%).
Conclusion: In the present study, early labor induction in pregnant women with hepatitis E induced acute liver failure significantly improved the fetomaternal outcome which thus advocates it to be preferred approach in the management of such women in future obstetric practice.
Keywords: Hepatitis E, Pregnancy, Fulminant Hepatic Failure, Early Labor Induction

INTRODUCTION

Physiological changes in cardiovascular, hepatic and urinary systems are a norm during pregnancy and are vital adaptations for the survival of mother and fetus throughout the course of gestation[1]. Thus it is normal for liver function tests to vary from physiological range during pregnancy. However, differentiation between these physiological and disease states is important[1,2]. As any liver injury during pregnancy particularly when it goes unchecked endanger the life of the mother as well as the fetus[2].

Each year, there are approximately 20 million cases of hepatitis E infection resulting into around 70,000 deaths[3,4]. Liver dysfunction is experienced in almost 3% of pregnancies but rarely progress to classical fulminant hepatic failure which is typically seen after hepatitis E infection during pregnancy[3,4,5]. Hepatitis E infection during pregnancy is associated with more severe disease that might result in fulminant hepatic failure if the infection is caused by genotype 1[6,7]. This severe and progressive liver injury soon shapes into multi-organ failure and put lives of mother and fetus in danger[7]. A conventional approach among such women is supportive management to improve liver and other organ function while monitoring fetal health. The aim is to improve liver function along with provision of ample time for fetal maturity[8,9].

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However, this practice has been recently questioned where a number of mothers expire before reaching term, others suffer severe postpartum hemorrhage due to coagulopathy[9-11]. Also this approach is associated with poor fetal outcome in the form of intrauterine as well as early neonatal death[9-11]. As pregnancy itself is associated with a number of physiological changes which may affect the course of liver injury, early induction of labor appears to shorten this phase by saving the fetus from maternal circulating toxins and limiting the burden over maternal cardiovascular and hepato-urinary systems which may improve the maternal outcome[1,2]. However, to date there was no such published material which necessitated the present study.

PATIENTS AND METHODS

The present study was a descriptive case series carried out at the Department of Obstetrics and Gynecology, Mayo Hospital Lahore over 2 years from September 2018 to August 2020. Sample size of 40 cases was calculated with 95% confidence level and 5% margin of error while taking expected frequency of hepatitis E induced acute liver failure to be 2.8% during pregnancy.[12] Non-probability, consecutive sampling was done and 40 pregnant females aged between 18-40 years presenting during 3rd trimester were included into this study after taking written informed consent. Patients were considered if they had reactive hepatitis E virus IgM antibodies with deranged liver function

tests. Those with viral hepatitis other than hepatitis E and alcohol induced or autoimmune hepatitis, already receiving hepatitis E treatment were excluded. We also excluded patients receiving corticosteroids, immunosuppressives, cholestyramine or other drugs that might affect liver function and women with other complications of pregnancy like preeclampsia, eclampsia and HELLP syndrome. All patients underwent complete clinical assessment consisting of history and clinical examination. These patients were managed by induction of pregnancy. Cesarean delivery was performed if induction of labor failed. All the patients were followed till discharge. Discharge criteria were woman with stable liver function tests, taking oral fluids and food and passing wind and stools. Maternal outcome was recorded in terms of need for cesarean delivery, postpartum hemorrhage and mortality while neonatal outcome was recorded in terms of intrauterine death and early neonatal death. All the patients were managed by a single obstetric team, induction of labor was performed using a single standard regimen consisting of vaginal misoprostol and decision of termination of trial and subsequent cesarean delivery was performed by a single consultant obstetrician to minimize bias while confounding variables were controlled by exclusion. The collected data was entered into and analyzed through Statistical Package for the Social Sciences (SPSS) version 19.0. Mean±SD has been calculated for numerical variables like age and gestational age while frequency and percentage has been calculated for parity and various fetomaternal outcome measures.

RESULTS

The age of the women ranged from 18 years to 40 years with a mean of 25.5±4.4 years. The gestational age of these women ranged from 28-36 weeks with a mean of 33.4±2.2 weeks. There were 11 (27.5%) primiparas and 29 (72.5%) multiparas as shown in Pie-Chart 1.

Pie-Chart 1 Distribution of parity in the study sample

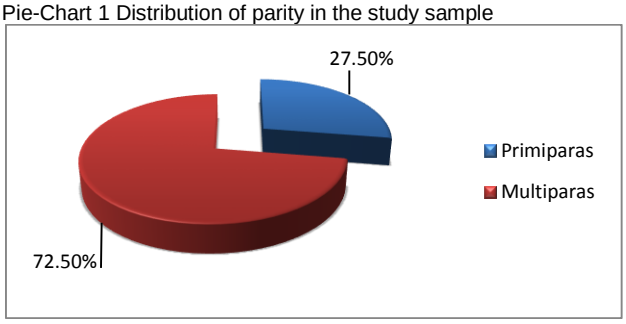

Table 1: Fetomaternal outcome of women with hepatitis E induced acute liver failure during pregnancy undergoing early induction of pregnancy n=40

Outcome Measure	Frequency (n)	Percent (%)
Maternal Outcome		
Cesarean delivery	12	30.0%
Postpartum hemorrhage	3	7.5%
Death	7	17.5%
Fetal Outcome		
Intrauterine death	4	10.0%
Early neonatal death	2	5.0%

Induction of labor was successful in 28 (70.0%) women while remaining 12 (30.0%) required cesarean delivery. Postpartum hemorrhage was noted in 3 (7.5%) women. Liver functions returned to normal in 33 (82.5%) women and were discharged home while 7 (17.5%) women expired during hospital stay. Intrauterine fetal death was recorded in 4 (10.0%) cases while 2 (5.0%) newborns expired during early neonatal period as shown in Table 1.

DISCUSSION

Hepatitis E infection during pregnancy is a well-known predilection[13]. Infections particularly occurring in the 3rd trimester with Genotype-I are known to follow a fulminant course with extensive liver injury and fulminant hepatic failure which is further complicated by multi-organ dysfunction and increased perinatal morbidity and mortality[13,14]. Contrary to conventional practice of managing the liver disease while continuing the pregnancy till term[9-11], in the present study we investigated the fetomaternal outcome of such pregnancies after early induction of labor.

In the present study, we observed that the mean age of the pregnant women with hepatitis E induced acute liver failure was 25.5±4.4 years. Our observation is in line with that of Naru et al[15] (2017) who observed similar mean age of 26.7±4.5 years among pregnant women with hepatitis E infection during pregnancy presenting at Aga Khan University Hospital, Karachi. In other local studies conducted at Isra University Hospital Hyderabad, Brohi et al[16] (2020) observed similar mean age of 26.6±6.4 years among such women while Khaskheli et al[17] (2015) reported it to be 27.8±6.7 years at Liaquat University of Medical and Health Sciences, Jamshoro. Gautam et al[18] (2018) and Jilani et al.[19] (2007) observed similar mean age of 24.6±2.9 years and 24.8±4.2 years respectively in Indian such women. Shinde et al[20] (2014) observed similar mean age among Nepalese such women and reported it to be 24.1±3.1 years.

We observed that the mean gestational age at the time of hepatitis E infection induced fulminant liver failure was 33.4±2.2 weeks. An observation which has also been made by Jilani et al[19] (2007) in India who reported a mean gestational age of 31.2±4.5 weeks among women with hepatitis E induced acute liver failure. In another Indian study, Patra et al.[11] (2007) observed it to be 31±4.1 weeks while a comparable mean gestational age of 35.7±1 weeks has been reported by Asghar et al.[10] (2019) among such women presenting at Sir Ganga Ram Hospital, Lahore.

In the present study, 27.5% of such women were primiparas and 72.5% were multiparas. A similar distribution of primiparas (27.3%) and multiparas (72.7%) among pregnant women with hepatitis E infection has been reported by Khaskheli et al.[17] (2015) at Liaquat University of Medical and Health Sciences, Jamshoro. Our observation is also in line with that of Shinde et al.[20] (2014) who reported the frequency of primiparas and multiparas to be 28.8% and 71.2% respectively among Nepalese such women.

In the present study, we observed that after early induction of labor fetomaternal outcome significantly improved evident from decreased frequency of Cesarean

delivery (30.0%), postpartum hemorrhage (7.5%), maternal death (17.5%) and intrauterine (10%) and early neonatal death (5%). These observed frequencies are much lower than reported by studies where women underwent expectant management of hepatitis E induced fulminant hepatic failure during pregnancy. In such a study, Asghar et al.[10] (2019) reported much higher frequency of Cesarean delivery (78.8%), maternal death (24.2%) and intrauterine (22.7%) and early neonatal death (28.8%) in such cases. In a similar Indian study, Patra et al.[11] (2007) reported much higher frequency of postpartum hemorrhage (14.0%), maternal death (41.0%) and intrauterine (58.0%) and early neonatal death (17.0%) after expectant management of pregnant women with hepatitis E induced acute liver failure.

The present study is first of its kind and to date there has been no such trial. The strengths of the present study were its large sample size of 40 cases and strict exclusion criteria. We observed that hepatitis E infection frequently involved younger, multiparous women during 3rd trimester. We also observed that early induction of pregnancy among such women was associated with improved fetomaternal outcome with majority of the women discharged home alive with much lower frequency of mortality as compared to conventional practice of expectant management where the reported fetomaternal morbidity and mortality is too high. Though these results favor the early induction of pregnancy among such women, there is need for future studies comparing other fetomaternal outcome measures as well as women with hepatitis E infection during second trimester which is complicated by liver injury on one hand and prematurity on the other. This information would further help in the selection of more appropriate treatment plan in patients with hepatitis E induced acute liver failure during pregnancy. Such a study is highly recommended in future obstetric research.

CONCLUSION

In the present study, early labor induction in pregnant women with hepatitis E induced acute liver failure significantly improved the fetomaternal outcome which thus advocates it to be preferred approach in the management of such women in future obstetric practice.

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