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EFFICACY OF ANTIVIRAL THERAPY IN HBSAG-POSITIVE PREGNANT WOMEN TO REDUCE MOTHER-TO-INFANT TRANSMISSION OF HEPATITIS B VIRUS

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Abstract:

Introduction and objectives: *the significant issue in the Pakistan is Hepatitis B. Hepatic cirrhosis and the cancer of liver can be caused by the infection of the hepatitis B. The transmission of virus of hepatitis B in blood and the products of blood is in horizontal direction. The transmission from mother to the child is in vertical direction. While transmission of the virus the chances of the occurrence of the infection of perinatal is very high which resulted in the chronic infection. The transmission of HBV1 should be prevented and it is very important. The purpose of the study is to minimize the MTCT by the utilization of antivirals.*

Materials and Techniques: *the experiment stated in this paper is on 60 pregnant women to check the effectivity of antivirals on them to minimize the chances of MTCT. The status of hepatitis B in the child is also monitored in the experiment. The age of the selected pregnant women rangers from 18 to 43 years and their period of gestational ranges from week of 28 to 32. The test of infection in liver, HBsAg and HBeAg were carried out of them. Viral load of HBV is tested in the women who has positive test of HBeAg. The patients who has high load of viral included in the study is 60%. All the patients were divided into two sub-categories.*

- *Group 1: from 28-32 weeks of period of gestation to 1 month after the end of delivery, lamivudine 100 mg is used daily to treat 31 subjects.*
- *Group 2: from 28-32 weeks of period of gestation and upto1 month of post-partum, tenofovir 300 mg is used daily to treat 29 pregnant ladies.*

The vaccines of hepatitis B is given to the infant in 1st and 6th month after birth but the HBIG is given to them in 24 hours after their birth. Infectivity of HBsAg is tested in the child who is of one-year age.

Findings: *in the 28-week of gestational period, the chances of MTCT and occurrence of HBV in infant can be reduced by treatment with tenofovir, antivirals and immunization of infant. To prevent the MTCT in infants at a higher level, Tenofovir and drug of category B should be used.*

Keywords: *Viral load, MTCT, Lamivudine, HBV, Tenofovir.*

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INTRODUCTION:

The significant reduction of virus of hepatitis B in the transmission of perinatal is done by the screening of maternal and immune prophylaxis which are both active and passive. The chances of the infection of HBV in the children at the age of 6-19 months is very high with the use of immune prophylaxis. Another condition for occurring HBV in children is the presence of HBsAg and HBeAg in the mothers. Because of the presence of the infection of intrauterine, the infection of HBV can be developed while using the immune prophylaxis and chances of this is 10 to 15 percent. The association of Pakistan related to the diseases of liver stated that each pregnant lady in her 1st trimester should screen against HbsAg, no matter is she is already vaccinated 1. There is a need to estimate the level of DNA of HBV in the patients who has HbeAg positive. 6 log ml is used by Wang et al. as cut-off. The chances of failure while preventing MTCT is 2% in the patients who has B6 log copies of the level of DNA of HBV. The chances of failure while preventing MTCT is 24% in the patients who has C6 log ml of the level of DNA of HBV. The women who has high risk of chronic infection of HBV and if therapy of antiviral is done them in 3rd trimester of pregnancy then there is a possibility of reduction of viral load in the mother and the risk of the transmission of perinatal can also be reduced 2.

METHODOLOGY:

The place selected for conducting the study is Institute of Health of Child and Maternal, Fatima Jinnah medical college Lahore in between February 2015 to June 2016. From the institute of standards of ethics, the clearance of ethics is taken for all patients. The questionnaire was filled from all the selected people in the following experiment for their permission. The experiment performed for the reduction of transmission of MTCT and to check the status of virus of hepatitis B in new born babies.

The age of the selected pregnant ladies' rangers from 18 to 43 years and their duaration of gestational period ranges from week of 28 to 32. The test of infection in liver, HBsAg and HBeAg were approved out of them. Viral load of HBV is confirmed in the women who has positive test of HBeAg. Women who has high load of viral included in the experiment is 60%. All selected women were divided into two sub-categories.

- Group 1: from 28-32 weeks of period of gestation to 1 month after the end of delivery, lamivudine 100 mg is used daily to treat 31 subjects.
- Group 2: from 28-32 weeks of period of gestation and upto1 month of post-partum, tenofovir 300 mg is used daily to treat 29 pregnant ladies.

The vaccines of hepatitis B is specified to the new born baby in 1st and 6th month after their birth but the HBIG is provided to them in 24 hours after their birth. Infectivity of HBsAg is tested in the children who is of one-year age.

Factual Analysis:

The software used for data entry is Microsoft Excel. The software used for the analysis of the provided data is package of statistical software with version 3.2 and this software is open-source. The data is collected in the form of mean and %age. The difference in the two sets of patients was calculated by the test of unpaired t. Test of paired t is used to check the difference of data which is paired. The purpose of the test of Chi- square is to observe the difference in the form of proportion and then the value of p is also calculated. If the value of p is 0.005 then the result will be significant.

Findings:

The number of the women who involved in this experiment is 60, 31 women from them is enrolled in group 1 who are treated with lamivudine 100 mg per day and remaining 29 are in group 2 and treated with tenofovir daily from the 28th week of gestation to 32nd week and until one month after post-partum.

The different on the basis of parity and age is not much significant in the women of both groups (Table 1).

Table 1: Demography

	Number	%
Group of Age = 60		
<19	4	4
20–30	48	83
≻30	9	11
Parity		
Para 1	19	32
Para 2	20	33
Para 3 and above	22	36

The range of parity and age is 1-3 and 10-30 separately (Table 2).

Table 2: Comparison of Positive HbsAg and Negative HbsAg

Status of HbsAg of Husband		
+ive	44	73
-ive	16	26
Diagnosis of infection of HBV		
1st pregnancy	30	50
2nd pregnancy	26	43
3rd pregnancy	4	06
way of delivery		
Vaginal	30	50
C-section	30	50
Test of Liver function		
Normal	40	66
Abnormal	20	33
Initial level of therapy of antiviral (weeks)		
<30	22	36
31–34	32	53
≻34	6	10
Side effects related to therapy of antiviral		
Nil	40	66.7
Minor	20	33.3
HBV copies of maternal Vs. drug		
Group A	2.4×10^6	
Group B	3.5×10^6	
Initial level of treatment Vs. drug		
Group A	31.9 weeks	
Group B	28 weeks	
Treatment duration and status of baby		
<5–6 weeks	+ive	
≻9 weeks	-ive	

	+ive (%)	-ive (%)	*p*
Treatment duration and status of baby			
<30 weeks	0	100	0.001
31–34 weeks	29	72	

⩾34 weeks	85	6.7	
Delivery mode and status of baby			
Vagnal	15	87	0.6
C section	10	91	

It is showed in table 2 that patients who has positive and negative HbsAg are 74% and 25% respectively. The patients identified +ive HbsAg in 1st pregnancy is 50% and the patients identified +ive HbsAg in 2nd pregnancy are 43%, patients identified +ive HbsAg in 3rd pregnancy are just 6%. The number of patients for which the delivery mode is vagina is 50 and those who are operated due to some worst indications and pain are also 50%. The result of the test of liver is satisfied in 66% women and the result of the 33% patients is not so good but there is no need of interventions.

There is a chance of occurrence of +ive HbsAg in the babies if the mother had not used antivirals. If a mother start taking antivirals before reaching at 30th week of pregnancy then her child couldn't have +ive HbsAg. The women who had started to take antivirals from 31st to 34th week of pregnancy, there is 29% chances of getting +ive HbsAg in her baby. The women who had started to take antivirals after 34th week of pregnancy, there is 85% chances of getting +ive HbsAg in her baby which is a serious issue (Fig 1).

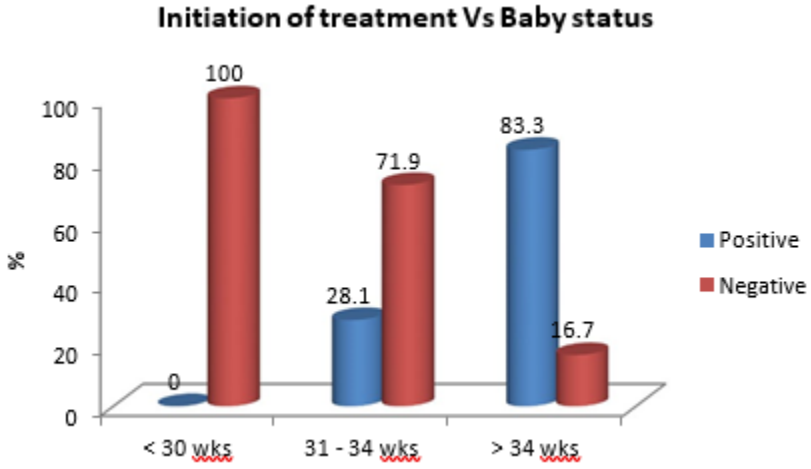

Fig. 1: Initial level of treatment Vs. drug

The percentage of having +ive HbsAg in infants who are delivered through vagina is 14%. On the other hand, the percentage of having +ive HbsAg in infants who are delivered through operation is just 10%.

Table 3: Comparison between Tenofovir & Lamivudine

Side effects	Group A Lamivudine	Group B Tenofovir	*p*
Nil	64.5%	69%	0.715
Minor	35.5%	31%	
HBV DNA load	6.3 log copies	6.54 log copies	0.11
Duration of treatment	8.1 weeks	8.14 weeks	NS
Baby status			
HbsAg positive	38.7%	6.9%	0.004

A comparison between two different drugs is showed in table 3. 33.5% patients who are intaking lamivudine are feeling nausea while the patients who are treated with tenofovir and they are feeling nausea are 31%. The results of the early stages of the treatment of viral load of HBV for the above-mentioned two groups are same. Not a considerable difference is observed in both groups regarding the period for the treatment of the antiviral. Group A requires 8.1 weeks while Group B requires 8.14 weeks for treatment.

The babies from both groups has considerable difference in state of HbsAg at the age of 1 year which is described in the below figure in the form of pie chart for both groups.

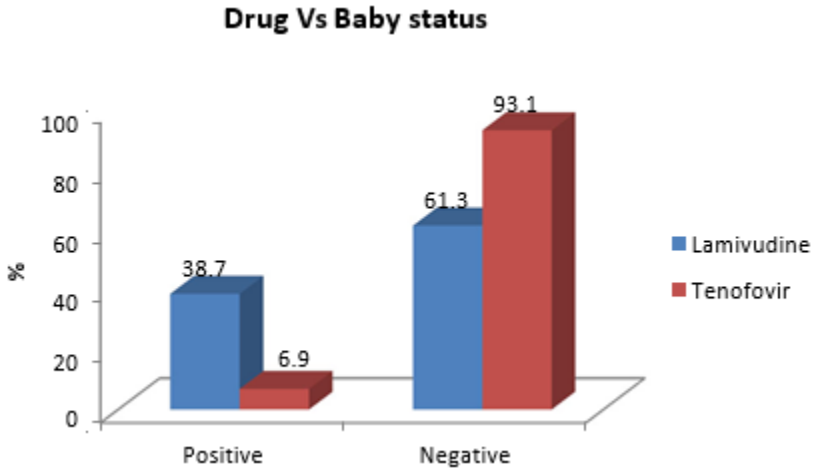

Fig. 2: Status of baby Vs. drug

DISCUSSION:

Be that as it may, the contamination transmission to the infant was seen in 39% in Gathering A (Lamivudine) and 7% in Gathering B (Tenofovir), despite getting immunoglobulin and dynamic inoculation during childbirth. The investigation likewise uncovered that in spite of the fact that the medications were given for equivalent length in the two gatherings, the Gathering B getting tenofovir was progressively powerful in diminishing maternal-to youngster transmission 3. The investigation likewise shows that if the antiviral was begun as right on time as 28 weeks there was no perinatal transmission of hepatitis disease, yet in the event that the treatment was begun past 34 weeks the viral trans-mission was as high as 85% 5.

As to MTCT of HBV during conveyance, it is as yet dubious whether the method of conveyance (vaginal versus cesarean segment) influences the vertical transmission pace of HBV 4. The in all probability course for intrapartum HBV transmission could be transplacental spillage of HBV-positive maternal blood during uterine withdrawals during conveyance. With high popular burden, an elective cesarean segment before the beginning of work may lessen the danger of intra-partum transmission of HBV contamination. In this manner, HBV DNA C8 log duplicates/ml in the antepartum period might be a significant factor while considering for cesarean area. Ladies with HBV DNA 11 log duplicates ought to be unquestionably considered for cesarean area 5. In our examination, 13.3% of patients with ordinary conveyance had newborn children positive with HbsAg and 10% of the individuals who experienced cesarean segment. Be that as it may, the sign of cesarean segment in these patients was primarily because of maternal or fetal sign and HBV DNA load was not the integral factor.

CONCLUSION:

In the 28-week of gestational period, the chances of MTCT and occurrence of HBV in the mothers can be reduced by treatment with antivirals. To prevent the MTCT in infants at a higher level, Tenofovir and lamivudine can be used at the last weeks of pregnancy as they both are safe drugs. The rate of effectivity of tenofovir is much higher with the involvement of immunoglobulins and vaccination of hepatitis as compared to the lamivudine.

To obtain the qualitative results, well-designed, high-quality, randomized controlled, double-blind and trials of clinical must be done.

Compliance with Standards of ethics:

Irreconcilable circumstance a few specialists proclaim that they have no irreconcilable situation.

Human and Basic entitlements a few specialists proclaim that no human research members were engaged with making this article. Dr. Jyoti Ramesh Chandran and Dr. Sajala Vimal Raj pronounce that no creatures were engaged with the examination.

Moral Norms Every one of the systems followed in the examination were as per the moral measures of the foundation; moral advisory group of the establishment had fundamentally assessed the investigation and its approach and given the endorsement before the examination was begun.

Educated Assent Educated composed assent was gotten from each patient to select them in the investigation.

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