Efficacy of HBV vaccination in pediatric liver transplant recipients.

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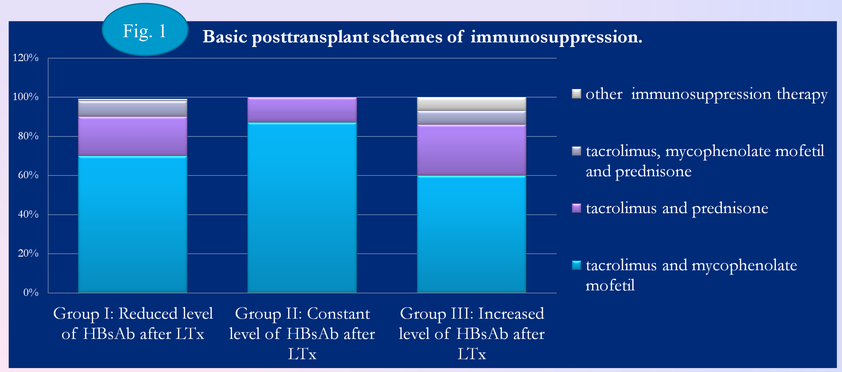
Introduction and Purpose. Patients who undergo liver transplantation (LTx) should avoid any liver injury and therefore vaccination against hepatitis B and optimal level of antibodies against hepatitis B surface antigen (HBsAb) have a fundamental role before and after transplantation. The aim of this study was to analyze titers of HBsAb before and after liver transplantation in pediatric patients.

Methods. A group of 148 pediatric patients who underwent LTx at The Childrens' Memorial Health Institute in Warsaw between 2001- 2010 was analyzed retrospectively. Two patients who received hepatitis B immunoglobulin (HBIG) were excluded from the study. Before transplantation patients were immunized with hepatitis B vaccine (Engerix, Euvax, Hepavax). The optimal pretransplant vaccination scheme was 0-1-6 months. However, the time of the completion of the immunization schedule depended on patient's medical condition (elective vs emergency surgery). HBsAb were measured before LTx and then monitored systematically. Main schemes of immunosuppression after LTx in relation to HBsAb titers are shown at Fig.1. Six patients received other immunosuppression therapy.

Fig. 1 Basic posttransplant schemes of immunosuppression.



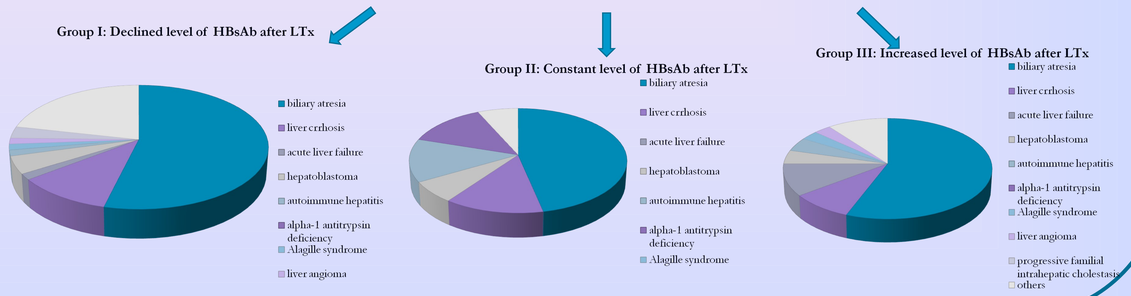
Results. The study group consisted of 82 females and 68 males. Median age at the liver transplantation was 1.3 y (range 0.1-18.6 y). In most cases liver was transplanted from the living-related donor (n= 108), and 42 transplants were of cadaveric origin. Indications for LTx included: biliary atresia (n=80), liver cirrhosis (n=15), acute liver failure (n=8), hepatoblastoma (n=7), autoimmune hepatitis (n=6), alpha-1 antitrypsin deficiency (n=4), Alagille syndrome (n=3), liver angioma (n=3), progressive familial intrahepatic cholestasis (n=2), and others (n=22). The median concentration of HBsAb directly before transplantation was 288 IU/L (range <0.1 IU/L - >1000 IU/L), and after transplantation it was 338 IU/L (range 20 IU/L - >1000 IU/L) [Fig.2]. In 44% of children the rapid decline of HBsAb was observed (median concentration before LTX 644 IU/L vs. 242 IU/L after LTx). In 10% of patients the level of HBsAb remained relatively constant (median before and after LTx >1000 IU/L), and in 46% of patients an increase of HBsAb was found (median concentration before LTX 111.6 IU/L vs. 435.5 IU/L after LTX) . Fig.3 shows characteristics of these three groups of patients.

Fig. 2

Pretransplant level of HBsAb titer:	% of patients
>1000 IU/L	26%
100-1000 UI/L	50%
10-100 IU/L	20%
<10 IU/L	4%
Posttransplant level of HBsAb titer:	
Declined	44%
Increased	46%
Constant	10%

Fig. 3

	Group I: Declined level of HBsAb after LTx	Group II: Constant level of HBsAb after LTx	Group III: Increased level of HBsAb after LTx
Number of patients (%)	65 (44)	15 (10)	68 (46)
Sex (Female/ Males)	33 / 33	11 / 4	39 / 29
Median age of the group (range)	12 mo (1 mo- 18.6 y)	4.2 y (0.6 mo- 17.9 y)	1.3 y (0.1 mo- 17 y)
Origin of the graft: living related LTx/ cadaver LTx	49 / 16	8 / 7	50 / 18
Pretransplant level of HBsAb median (range)	644 IU/L (91 - >1000)	>1000 IU/L (806 - >1000)	111.6 IU/L (0.1-584)
Postransplant level of HBsAb median (range)	242 IU/L (20-800)	>1000 (905 - >1000)	435.5 IU/L (31 - >1000)
Number (%) of patients with rejection episodes	28 (43.1)	4 (26.7)	34 (50)
ABO incompatibility, number (%)	11 (16.9)	1 (6.7)	6 (8.8)
PELD/ MELD score (in patients with liver failure), median (range)	14 (1- 37)	14 (1- 23)	11 (1- 36)



Conclusion. Further long term follow up is necessary to identify factors affecting the level of immune response to hepatitis B vaccine and responsible for a rapid decline of HBsAb in many liver transplant receipients.