Immunological Status of Hepatitis vaccin among B-Thalassemia major patients in Diwaniya

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الخلاصة:

شملت هذة الدراسة اثنان وستون من مرضى الثلاسيميا الذين كانوا يحضرون لمستشفى الولادة والأطفال التعليمي في الديوانية بانتظام ، بالأضافة الى اثنان وعشرون شخصا من الأصحاء ،أجريت الفحوصات المصلية لجميع العينات خلال الفترة من يناير2013- مارس 2013وقد استخدمت تقنية ELISA للكشف عن وجود HBS-Ag، HBC و HBs-Ab . اظهرت النتائج حالة واحدة فقط إيجابية لاختبار HBsAg . في حين حالتين كانت إيجابية ل HCV . علاوة على ذلك ، كانت اربعة (6.5 ٪) حالات من المرضى لايملكون مضادات HBs-Ab) اللقاح كانوا أكثر عرضة للأصابه . لذلك بينت النتائج ان معيار الأجسام المضادة لة علاقة عكسية مع عدد مرات نقل الدم .علية توصي الدراسة بأجراء الفحص المنتظم في المراكز لتقيم الحالة المناعية التهاب الكبد لمرضى الثلاسيميا

Abstract:

Sixty two thalassemic patients who were regularly attending maternity and obstetrics teaching hospital Al- Diwaniya ,(22) who were apparently healthy, all have enrolled for serological screening during the period (January 2013- March 2013(

The ELISA is used to evaluat the load of HBs-Ag, HBC and HBs-Ab.Only one case has given positive for HbsAg test , while (2) of the patients showed positive test for HCV .Moreover,4(6.5%) patients had no HBs-Ab in their serum and at high risk of contract infection . The titer of these antibodies has shown to be negatively correlated with number of blood transfusions .A regular screening for Hepatitis immunologic status is recommended.

Aims of the study to detect and clarify the immunologic status of β-thalassemia patient by evaluation of hepatitis B and C , antigens and antibody using ELISA.

Introduction:

Thalassemia describe a group of autosomal inherited disorders characterized by defects in globin chains of hemoglobin, these genetic defects are mutations in beta-globin gene causing a beta-thalassaemia while, the alpha thalassemia results from deletion in α-globin gene(s). These two basic groups of thalassemia disorders: alpha thalassemia and beta thalassemia are causing varying degrees of anemia, which can range from insignificant to life threatening(1).Thalassemia is among the most common genetic disorders worldwide, occurring more frequently in the Mediterranean,Indian subcontinent, Africa and south EastAsia(2) Beta-thalassemia is considered as the most common autosomal single-gene disorder worldwide characterized by hypochromic microcytic anemia (3). The most severe form is β-thalassemia major which constitutes a major public healthproblems in the endemic regions characterized by severe anaemia beginning in the first year of life and patients require maintenance red cell transfusions every 4-6 weeks(4). Frequent blood transfusions necessary for the treatment of thalassaemia major have improved not only their survival, but also their quality of life. However, it carries a definite risk of being infected with blood borne viruses(5). Hepatitis B virus (HBV) infection is one of the most common transfusion transmitted (6). Infections Hepatitis B virus (HBV) infection acquired during infancy and early childhood is the major cause of chronic liver disease and liver cancer worldwide. Active immunization by

administration of hepatitis B vaccination before exposure to the virus is the most effective way to prevent infection and related hepatocellular carcinoma.(7,8) . On the other hand, thalassemic patients may have iron overloading due to chronic blood transfusion which could lead to impaired immune response toward vaccination (9).Therefore, determination of immune response in multi-transfused patients is very important.

Materials and methods:

This study was performed in Hereditary Blood Diseases Center in maternity and obstetrics teaching hospital Al- Diwaniya during the period between January 2013 to end to March 2013. Sixty two randomly selected clinically diagnosed β-thalassemia major patients during period of regular blood transfusion and treatment

ELISA tests have been performed to detect anti-HBsAb ,HBsAg and HCV in the of all study members.

Results:

All of the 62 thalassemia patients were evaluated for the presence of Hbs-Ab and compared with other control group (22 healthy individuals) who vaccinated with the three doses HBV vaccine.

Results in table (1) shows that there are four (6.4%) thalassemic patients were negative to Hbs-Ab. Statistical analysis stated that there is no significance between the two tested groups at $p<0.05$

Table (1): Frequencies and percentage of anti-HbsAb and control group in thalassemia patients in Al-Diwaniya province

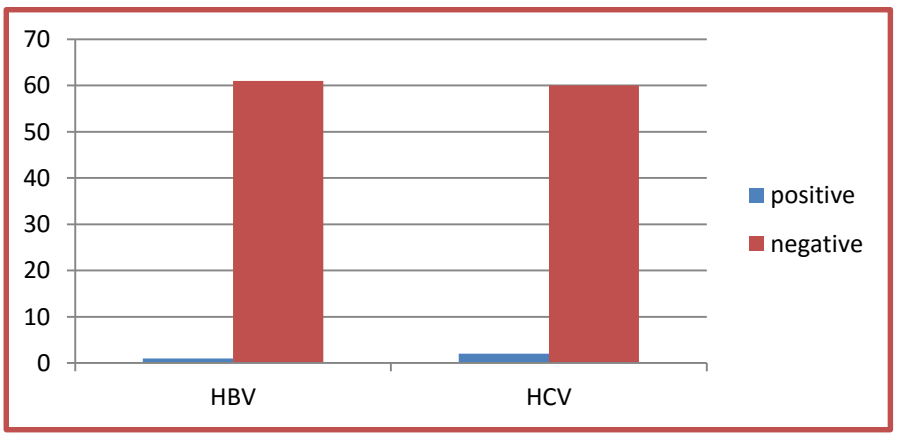
Hbs-Ab	Patient		Control	
	Frequency	%	Frequency	%
Positive	58	93.5	22	100
Negative	4	6.5	0	0
Total	62	100	22	100

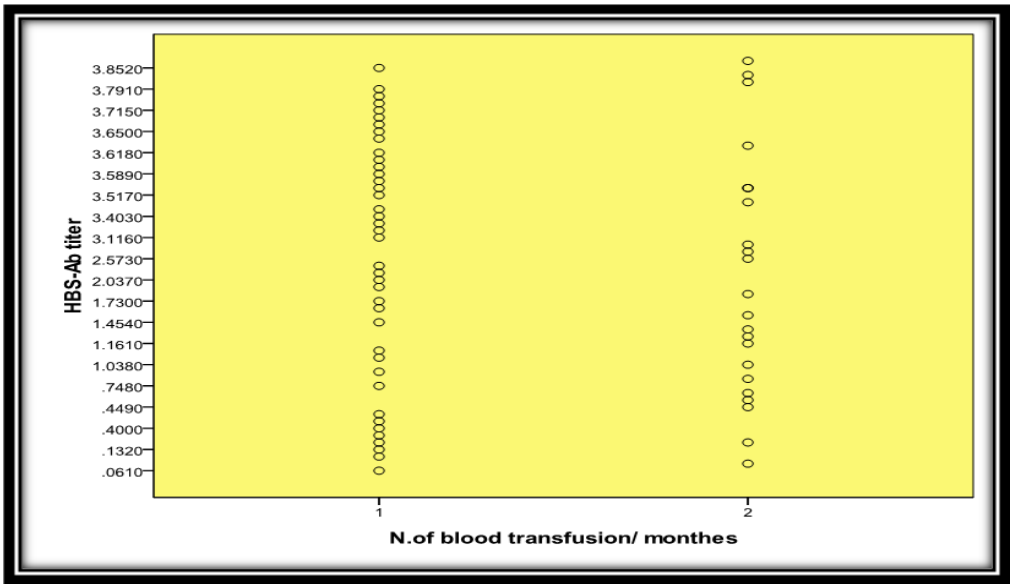
With respect to the incidence of HBsAg among 62 thalassemia patients enrolled in this study , the record is illustrated in (figure 1), only 1.6% of there seems to be picked-up the infection ,where is the other majority of the patients given negative results for this antigen

A nearly high 2(3.3%) of our patients have been recorded to had Hepatitis C infection (figure 1).

Figure (1) :prevalence HBV and HCV virus in Thalassemia patients .

Statistical analysis indicates that is a negative relationship between blood transfusion and HBV antibody titter(r= -0.114) (figure 2).





Figure(2):Correlation between Hbs-Ab titter and no. of blood transfusion in thalassemia patients in Al-Diwaniya province.

Discussion:

Is this study, we have focused on 62 serum samples of patients with thalassemia who have completed vaccines and received three doses of recombinant HBV vaccine in months 0, 1 and 6 were selected. As well as 22 of the control group taken from health personnel to ensure the completion of three doses determination of immune response in multi- transfused patients is very important. Our results presented 58 (93.5)patients with thalassemia were positive anti-HBs (responders)and 4(6.5)were negative anti-HBs (non- responders). Patients who did not respond to the vaccine, including one infected with Hbs-Ag and two HCV infected either lack responsiveness perhaps to return to several reasons

HCV affects the response of the vaccine and there is an evidence on that. Them,(10)state that patients with HCV are considered high- risk factor and affects the response to the vaccine. (11) prove that hepatitis C virus (HCV) infection is highly prevalent in thalassemic patients. This may decrease serum antibody response to hepatitis B virus (HBV) vaccine. The unresponsiveness to vaccination among such patients be attributed to several reasons; increased risk of nonresponse has been associated with immunodeficiency disorder ;allergy to any drug ; receiving immunosuppresive therapy; liver cancer; smoking and Obesity (12). Or may be ,iron over loading due to chronic blood transfusion which could lead to impaired immune response toward vaccination (9).As well as patients after allogeneic BMT(bone marrow transplantation), in whom there is an almost complete loss of immunologic function(13) .Moreover, the immune response to HBV vaccine seems to be T-cell dependent and may be affected by conditions associated with impaired T-cell function (14)

Several studies with controversial results regarding immunity level and acquired immunity from hepatitis B vaccination have been performed in different countries Our study agreed with other studies, including (15)study in which out of the 99 patients only 89 were responded to the vaccine, for those who did not respond to the vaccine, including one with HBs-Ag positive and the others were anti- HBc positive, the latter may be the reason for not responding to vaccine. In Kerman, Iran, (16), found that, from 215 children with major

thalassemia, 34.8% were non responders and the remaining were either low or good responders. (15) in another study reported the response rate was 89.9% anti-HBs positivity in thalassemic children.

That is the greater the number of blood transfusions times the concentration of antibodies in the body will be less because frequent blood transfusion resulting in more iron overloading .This affect the immune system (17 ,9, 18). Due to the lack of studies in this regard, but there are studies that prove that must be given a booster dose of the vaccine over age and we know that there is a relationship between age and the number of times a blood transfusion and these studies, (19) a study on children in China, serum anti-HBS was 77% within 2 years of vaccination and it decreased to 48.2%, 7 years post vaccination. in Spain (20)on a pre-pubertal group, 50% of those vaccinated had serum protective anti-HBS level after 7.5-10 years. It was suggested to have a booster dose, 10 years after the primary vaccination to acquire complete immunity.While (21) found that children with major thalassemia are at highrisk group and it is advisable to measure serum anti-HBS level 5 years after the last vaccination and if necessary, give them a booster dose at that time. In another study of the (22) who concluded that high risk groups of children with repeated blood transfusion proved to become significantly risky for HBV infection secondary to loss of Anti-HBs protective titer after a variable period of time. And we can add that this significant drop occurs above the age of three years

Conclusion:

Anti-Hbs Ab is a good test screening method determine the proportion of vaccine response. Response rate to vaccination is more than 93.5% after complete course (3 doses).

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