Re-Evaluation of Hepatitis among Polytransfused Egyptian Children

Thesis

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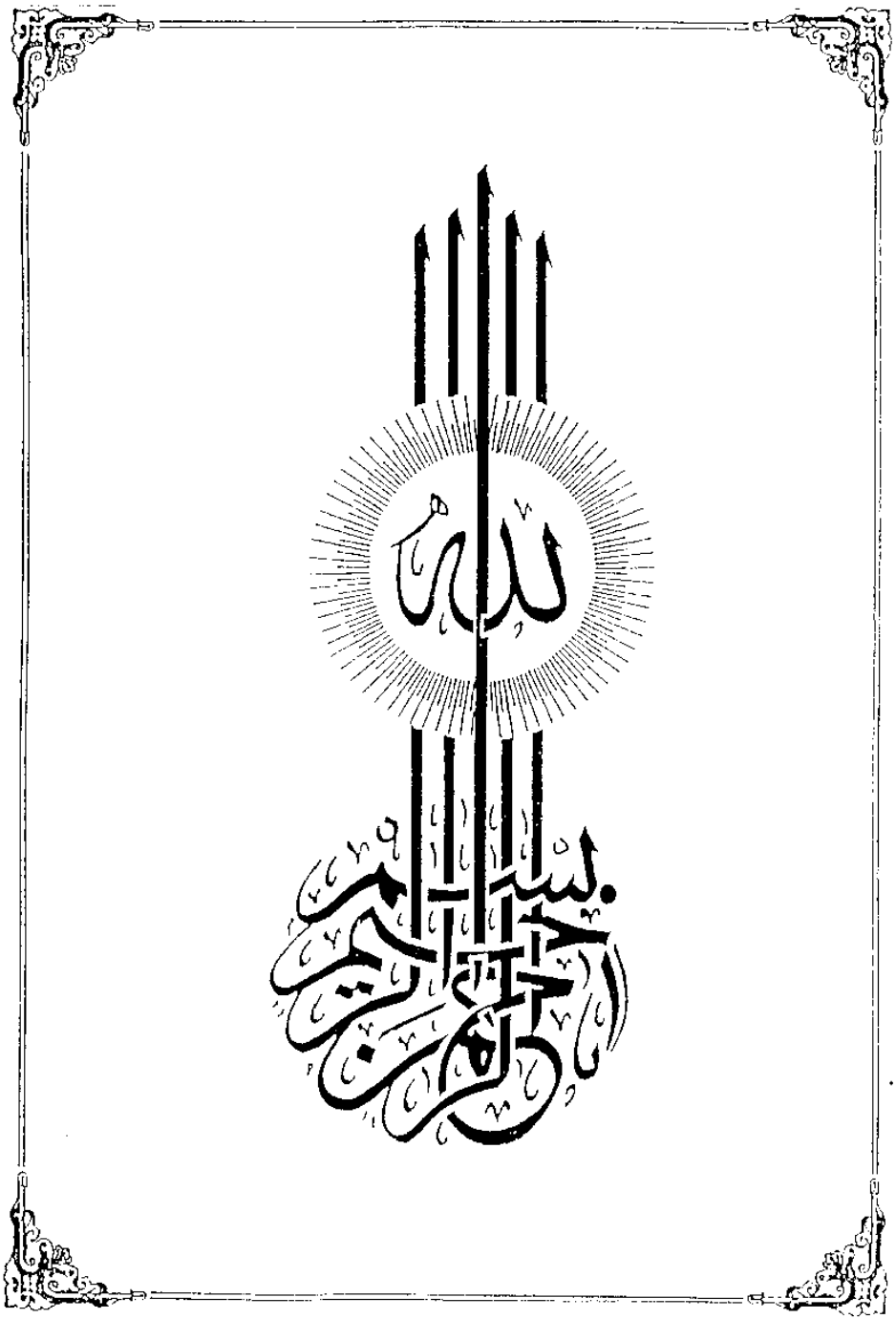

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List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ALT	Alanine Aminotransferase
Anti-GOR	Antibody to GOR epitope
Anti-HBc	Antibody to Hepatitis B- Core Antigen
Anti-HBe	Antibody to Hepatitis B- e Antigen
Anti-HBs	Antibody to Hepatitis B surface Antigen
Anti-HCV	Antibody to Hepatitis C virus
Anti-HDV	Antibody to Hepatitis Delta Virus
Anti-HIV	Antibody to Human Immunodeficiency Virus
AST	Aspartate aminotransferase
CAH	Chronic Active Hepatitis
CMV	Cytomegalo Virus
CPH	Chronic Persistent Hepatitis
DNA	Deoxyribonucleic Acid
DNA-P	DNA-polymerase
EBV	Epstein-Barr Virus
EIA	Enzyme Immunoassay
ELISA	Enzyme Linked ImmunoSorbent Assay
$ELISA_2$	Second Generation ELISA
EPI	Expanded Programme on Immunization
FDA	Food and Drug Administration
FFP	Fresh Frozen Plasma
HAV	Hepatitis A Virus
HBcAb	Hepatitis B core Antibody
HBcAg	Hepatitis B core Antigen
HBeAg	Hepatitis B-e Antigen
HBIG	Hepatitis B Immuno globulin
HBsAb	Hepatitis B surface Antibody
HBsAg	Hepatitis B surface Antigen
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus

HCC	Hepato Cellular Carcinoma
HDV	Hepatitis Delta Virus
HIV	Human Immunodeficiency Virus
HNANB	Hepatitis Non-A, Non-B
HTLV-I	Human T-lymphotropic virus-I
IG	Immunoglobulin
NANB	Non-A, Non-B
NS region	Non Structural region
PCR	Polymerase Chain Reaction
PTH	Post-Transfusion Hepatitis
RBCs	Red Blood Corpuscles
RIA	Radio ImmunoAssay
RIBA	Radio ImmunoBlot Assay
RNA	Ribonucleic Acid
SIG	Standard Immunoglobulin
TAH	Transfusion Associated Hepatitis

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Introduction

INTRODUCTION

Transfusion- associated hepatitis (TAH) is the most common serious consequence of blood transfusion and an important cause of chronic liver disease among transfusion dependent patients (Aach and Kahn, 1980 and Di-Macro et al., 1992).

Although transfusion-associated acquired immunodeficiency disease (TA-AIDS) has captured the world's attention in the recent years because of its devastating clinical syndrome and universal fatality, the number of cases of TA-AIDS is miniscule as compared with TAH (Alter and seeff, 1993). Measures introduced since 1985 have markedly reduced the incidence of TAH, although the observed decline has been documented in only a limited number of prospective studies (Feinman et al., 1988; and Donahue et al., 1992).

The prevalence of TAH has fallen from rates that exceeded 30% in the 1960s to rates that may be below 1% in the 1990s (Alter and Seeff, 1993). Numerous studies were performed during 1980s in many countries, establishing that TAH has a global distribution, with a varying frequency, ranging from 2.5 to 15 percent (Colombo et al., 1987, and Feinman et al., 1988). In the vast majority of these studies, almost all the cases were of non-B hepatitis origin, even in Taiwan, where Hepatitis B virus (HBV) is endemic (Wang et al., 1991).

Children who have blood element disorder requiring repeated transfusions, including patients with thalassaemia and haemophilia, are liable to contract HBV alone or with HDV (Khalifa et al., 1990), HCV or any other virus leading to post transfusion hepatitis (PTH).

Another risk factor, suggested first by Allen and Sayman (1962), was that the hepatitis rate correlated with the number of units transfused. The Japanese Red Cross (1991) have reported a prevalence of 4.9% among those who received 1-10 units of blood and of 16.3% among those given 11-20 units.

In Egypt, a study was carried out to find the prevalence of TAH in polytransfused children in 1983. The total percentage of TAH was 50%. Hepatitis B accounted for 47.6% of cases while NANB was responsible for 52% by exclusion (Abdel Ghaffar, 1983).

Khalifa et al. (1990) followed up polytransfused infants and children attending the Haematology/Oncology Clinic, Children's Hospital, Ain Shams University for one year. They found that hepatitis "B" surface antigenaemia was 6.6% at the beginning of the study, an incidence similar to that of the general population. However, after 12 months follow up, this incidence increased to 41% despite HBsAg screening for blood donors.

Aim of the Work:

With introduction of better screening in Ain Shams University Hospitals' blood bank, it will be of value to re-evaluate the prevalence of HBV and HCV infections among polytransfused children after introduction of these techniques during the past 3 years.

The aim of the present study is to re-evaluate the prevalence of HBV and HCV infections among polytransfused children, and to correlate the hepatitis rate with the duration of receiving transfusion therapy.

Literature Review

BLOOD TRANSFUSION: INDICATIONS AND HAZARDS

The Physician deciding whether to give a transfusion has the responsibility of weighing the expected benifits against the known risk. Blood transfusion is not an innocuous minor procedure used to hasten recovery from illness and operations, and should never be a matter of routine in the replacement of minor losses at surgery. Complications of blood transfusion consist particularly of acute transfusion reactions and various delayed complications, such as disease transmission and alloimmunization (*Huestis et al*, 1988).

The most effective measure of prevention is the avoidance of transfusions that are not absolutely essential, so it is important to know about the indications of transfusion therapy for avoidance of unnecessary use of blood and blood products.

Indications of Blood Transfusion

The advent of component therapy and the separation of whole blood into its individual constituents has the advantage of giving specific therapy that depends on the patient needs (Lawrance, 1992). Indications of transfusion therapy are listed in table 1. Out of these we are concerned with patients requiring repeated transfusions.

Table-1 Indications of Transfusion Therapy (*Sohmer, 1984*)

I- Haemorrhage
II- Anaemia
III Thrombocytopenia
IV- Heriditary haemorrhagic disorders
A- Haemophilia
B- Von Willebrand's disease
C- Fibrinogen deficiency
D- Factor II deficiency
E- Factor V deficiency
F- Factor VII deficiency
G- Factor X deficiency
H- Factor XI deficiency
I- Factor XIII deficiency
V- Acquired haemorrhagic disorders
A- Vit K deficiency and oral anticoagulants
B- Disseminated intravascular coagulopathy
C- Liver disease

Indications of Repeated Transfusion Therapy

Anaemia

The blood haemoglobin concentration or haematocrit alone should not determine the need for transfusion. Physiologic adaptation to anaemia, including elevated red cell 2,3-diphosphoglyceric (2,3-DPG) content and increased cardiac output, compensate to a significant

extent for chronic anaemia (*Schroeder and Rayner*, 1993).

Transfusion therapy for chronic stable anaemia is almost never indicated when the haemoglobin concentration is greater than 10g per dl (Sohmer, 1984). When the haemoglobin value is less than 6g per dl, transfusion is often required to prevent or treat symptoms of anaemia. Between these two limits, the decision to transfuse should be based on a consideration of patient's age, cardiovascular and respiratory status, symptoms, underlying diagnosis and state of bone marrow activity. Children can tolerate lower haemoglobin levels (*Schroeder and Rayner*, 1993).

In children with thalassaemia, bone marrow hyperplasia may be ameliorated, and iron absorption may be decreased, by regular transfusions to maintain a near normal haemoglobin concentration (*Greenwalt and Zelenski*, 1984). In aplastic and sideroblastic anaemias, myelodysplastic states, and myelofibrosis, patients frequently depend on regular transfusions of red cells. Patients with malignant diseases often require transfusions for relief of symptoms of anaemia. In this situation, marrow function often is severely depressed by chemotherapy and/or radiotherapy (*Schroeder and Rayner*, 1993).