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بالرسالة صفحات لم ترد بالأصل

EFFECT OF ACUTE PERIOPERATIVE HAEMODILUTION AND AUTOLOGOUS BLOOD TRANSFUSION ON SOME COAGULATION AND HAEMODYNAMIC FUNCTIONS DURING OPEN HEART SURGERY.

THESIS

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Contents

INTRODUCTION

Introduction

(1)Historical Review

Experimental blood transfusion in between animals and man has a long history dating back to shortly after the description of the circulation of blood by William Harve in1628 [1]. In February 1665, Lawer's performed the first transfusion experiment. It was artery to vein transfusion from one dog to another [2].

The first recorded transfusion of donnor blood to man for therapeutic purposes was performed by James Blundell in 1818 [3]. Intraoperative blood scavenging was first reported by High more in 1874 [4].

The first use of autotransfusion was reported by Duncan in 1886 [5] in a patient with crushed legs from railway injury. While amputating the leg, Duncan collected the shed blood in a dish with phosphate of soda and returned it to the patient. In 1914, Thies [6] reported the use of autotransfusion in three patients with ruptured ectopic pregnancy. The use of autologous blood became a well accepted technique. Bernard Fantus [7] in 1937 described a program for preoperative autotransfusion and was

credited with organizing and reporting the first active blood bank.

Auto transfusion fell into obscurity in 1940's and 1950' sbecause of the development in blood banking that made homologous blood transfusion simple and safe [8].

In 1963 Langston and colleagues[9] reported the development of a predeposit program. Intraoperative salvage of shed blood increased by the year 1969 after setting up of Bently unit and the introduction of sorensen autotransfusion system and the haemonetic cell savers by the year 1975.

Cardiac surgeons were the first to recognize haemodilution potential in blood conservation. In 1962 Cooley et al[10]. Clearly demonstrated the safety of non blood priming solution and the dilution of the patients blood to haematocrits of about 20% has become standard practice during the cardiopulmonary bypass. In 1973 several cardiac surgeons advocated not only non blood priming solutions but also the withdrawal of autologous blood before cardiopulmonary bypass and the subsequent reinfusion of the blood after termination of assisted circulation[11].

The combination between perioperative autologous blood collection and haemodilution had been popularized in surgery by Messmer [12] in 1975. There after, hundreds of articles have been appeared on many different aspects of autotransfusion and

almost all of these has come to one conclusion: Autotransfusion is both life saving and a blood saving technique.

(2)Banked (Homologous) blood transfusion

I - Blood groups:

Human red cell membrane are estimated to contain at least 300 different antigenic determinants. At least 20 separate blood groups antigen system are known. The expression of each is under genetic control from a separate chromosomal locus. Fortunately, only the ABO and Rh. Systems are important in the majority of blood transfusion[13].

1.The ABO system

The chromosomal locus for this system produces three alleles: A, B and O.Each represents an enzyme that modified a cell surface glycoprotein, producing a different antigen.The O enzyme is functionally silent and there are two variants of A: A_1 and A_2. Almost all individuals not having A or B naturally produce antibodies (mainly IgM) against those antigens within the first year of life.

2.The Rh system

The genetics of the Rh gene is complicated, probably Involving three chromosomal loci with a total of six alleles. Only

the presence or absence of the most common and most immunological allele, the D-antigen is considered. Individuals lacking this allele are called Rh-negative and usually develop antibodies against the D-antigen only after exposure to a previous (Rh-positive) transfusion or pregnancy.

3.Other systems

Other systems include the lewis, P, I, MNS, Kicld, Kell, Dubby, Lutheran, Xg, Sid, Cartright, York, Chido, and Rodgers. Fortunately, With a few exceptions, alloantibodies against these systems rarely cause serious haemolytic reactions.

II - Homologous blood banking & transfusion practices:

Donors are screened to exclude medical conditions that might adversely affect the recipient. The haematocrit is determined, and if it is normal the blood is typed, screened for antibodies, and tested for hepatitis B, hepatitis C, syphilis, and HIV-1 and HIV-2.

Once blood is collected, a preservative – anticoagulant solution is added. The most commonly used solution is CPDA-1, which contains citrate as anticoagulant phosphate as buffer, dextrose as red cell energy and adenine as a precursor for ATP synthesis. CPDA-1 preserved blood can be stored for 35 days, after which the viability of red blood cells, rapidly decreases[14].