INCIDENCE OF BACTERAEMIA AFTER ELECTIVE ELASTIC BAND LIGATION AND INJECTION SCLEROTHERAPY IN DECOMPENTS CLRRHOTIC PATIENTS

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ABSTRACT

They were admitted in the Endemic Medicine Department and they were referred for esophago-gastroduedonoscopy in the gastrointestinal Endoscopy and Liver unit. Only patients with esophageal varices gradeIII and IV according to Thakeb et al.1988 were included. They were grouped in three groups.

KEYWORDS

Bacteraemia_elastic_decompensated

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AHA	American Heart Association
ACTH	Adrenocortico Trophic Hormon
AER	Automatic Endoscope reprocessor
APCS	Antigen Presenting Cell
CHD	Congenital Heart Disease
EGD	Essophago Gastro Duodenoscopy
EUS	Endoscopic Ultrasonography
ERCP	Endoscopic retrograde cholangio panreaticography
FDA	Food and Drug Administration
FNA	Fine Needle Aspiration
GI	Gastrointestinal
HLD	High Level Disinfection
IL-1	Interleukin-1
KCS	Kupffer Cell
LPS	Lipo Polysaccharridas
LSES	Liver Sinusoidal Endothelial Immune System
MHC	Major Histocompatibility Complex
MRSA	Methicillin-resistant Staphylococcus Aureus
NK CELL	Natural Killar cell
PSC	Pancreatic Pseudocyst
PEG	Percutanous Endoscopic Gastrotomy
RES	Reticulo Endothelial System
TCR	T Cell Receptor
TNF	Tumour Necrosis Factor

INTRODUCTION

Endoscopic procedures, which are commonly employed for diagnosis and treatment purposes in gastroenterology units, can lead to various complications, bacterial infection due to endoscopic procedures may occur, depending on factors as duration of procdure contamination and structure of device, inapproiate disinfection and insufficient mechanical cleaning of devices **(Spannch et al., 1993)**

The most commonly seen systemic complication of endoscopic examination is fever, which results inflammation rather than infection however, there art rare reports of serious complications such as brain abcesses, pcrinepheric abcesses, bacterial peritonitis and endocarditis **(Bamett JL and Rlta, 1987).**

The incidence of bacterial infection in hospitalized cirrhotic patients is higher other patients, ranging from 33% to 61%. The most frequent infections are urinary tract infections 12%, spontaneous bacterial peritonitis 23%, respiratory infections 6%, bacteraemia 4%. Bacterial infections account for up to 38% of deaths in patients with chronic liver disease, both directly or in directly **(Rosa et al, 2001).**

It has been reported that cirrhotic patient have a higher level of bacteraemia incidence before and after endocopy due to reticuloenthelial system failure, neutrophil disorders chemotaxis, low level of serum complement and deficiency in cellular immunity **(Zuccaro et al, 1997).**

After diagnostic upper gastrointistinal endoscopy bactearaemia rate is low (up to 4%) and it docs not seem to increase with biopsy or polypectomy **(Low et al., 1987).**

Aim of the work:

The aim of this study is to investigate the incidence of bacteremia following elective elastic band ligation and injection sclerotherapy in decompensated cirrhotic patients.

THE LIVER AND IMMUNITY

The liver is unique anatomical and immunological site which antigen-riched blood from the gastrointestinal tract is pressed through a network of sinusoids and scanned by antigen-presenting cells and lymphocytes. The liver's lymphocytes population is selectively enriched in natural killer T cells which play roles in first line immune defense against invading pathogens , modulation of liver injury and recruitment of circulating lymphocytes, **(Racanelli and Reherman , 2006)**

Circulating lymphocytes come in close contact to antigens displayed by endothelial cells, Kupffer cells and liver resident dendritic cells in the sinusoids, circulating lymphocytes can also contact hepatocytes directly, because the sinusoidal endothelium is fenestrated and lacks a basement membrane. This unique anatomy of the liver may facilitate direct or indirect priming of lymphocytes, modulate the immune response to hepaotropic pathogens and contribute to some of the unique immunological properties of this organ, particularly its capacity to induce antigen specific tolerance **(Racanelli and Reherman , 2006**)

The liver holds a unique position as regard to the blood circulation. It receives venous blood draining from almost the entire gastrointestinal tract via the portal vein and from the systemic circulation via the hepatic artery. More than 2000 liters of blood pass daily through the human liver about 300 times per day. These simple fact clearly demonstrate that the liver is a meeting- point for

antigens and leukocytes circulating in the blood, **(Knoll and Limmer , 2003**).

Among the several functions of the liver, clearance of the blood from macromolecules and its metabolization are important for understanding of the liver as an immuno-regulatory organ. Nutrients are extracted from portal venous blood and further used for hepatocellular metabolism. Also, the liver eliminate toxic waste products and pro-inflammatory agents, such as endotoxins and other bacterial degradation products that are derived by translocation from gut **(Oda et al, 2000)**

Microanatomy of the liver

The liver is considered as an intrinsic immunological organ due to its unique participation in both innate and adaptive immune responses. Additionally, it is considered a site of inflammatory reactions of different origin, **(Oda et al, 2000)**

The liver is optimally structured to function as a metabolic organ, i.e. Clearance of blood from macromolecules and release of metabolic products from hepatocytes into blood stream. Nutrient-rich blood from the gastro-intestinal tract enters the liver via portal vein with hepatic artery and bile duct surrounded by connective tissue forming the portal tract. Portal-venous and arterial blood drain into the hepatic sinusoids, which form a three-dimensional meshwork of vessels generating a mixed artero-venous perfusion of the liver. Blood flows from the portal tract to the central veins which convene to hepatics draining into the inferior vena cava, **(Knolle and Limmer, 2003).**

The metabolic and excretory functions of the liver depend on the hepatic parenchyma and biliary ducts and they compise about 60%-80% of all hepatic cell; the remaining 20%-40% of are non parenchymal cells and they are mostly concerned with immunological functions, (**Racanelli and Reherman, 2006)**.

Those non-parenchymal cells include: liver sinusoidal endothelial cells(50%), with the residue consisting of resident and non resident phagocytes of the innate immune system (Kupffer cells, dendritic cells) ,NK cells NK-T cells and immigrant T and B lymphocytes of the adaptive immune system **(Macphee et al, 1995 and Mehal et al , 2001)**.

The cellular composition of the liver suggests that it has a major role in innate defenses. Compared with the lymphocyte population in blood and other organs, the lymphocytes of the liver include a much higher proportion of natural killer(NK) cells, NK-T cells, γδT lymphocytes, all of which are involved in the innate immunity, **(Doherty and 'Ofarrely, 2000).**

The close proximity of these cells to antigene-presenting cells and Tand B cells suggests that critcal links between innate and acquired immunity exist withen the liver, **(Levy et al, 2003)**.

CELLULAR COMPONENTS OF LIVER IMMUNE SYSTEM

Liver Sinusoidal Endothelial Immune System

Liver sinusoidal endothelial cells form a thin continuous layer that separates the leukocytes passing inside the liver withen the blood stream from the hepatocytes. In contrast to endothelial cells in other organs, there is no basement membrane. The space between hepatocytes and LSECs is called the space of disse, which contains abundant extracellular matrix produced by LSECs and populated by the stellate cells that span around the LSECs and control sinusoidal blood flow by contraction lead into reduction of the sinusoidal diameter **(Oda et al , 2000)**.

Kupffer cells(KCs)

KCs are derived from circulating monocytes that arise from the bone marrow; they account for the major portion (80%-90%) of the risdent macropages in the entire body. They made up to 15% of the total liver cells **(Van de Water et al, 2003)**.

They located predominantly in the sinusoidal lumen in the periportal region. They migrate slowly on top of LSECs and can lead to a temporary microcirculatory arrest in hepatic sinusoids by blocking the lumen. This leads to slow blood flow in the sinusoid which is ideal for clearance of macromolecules from the blood and initiation of contact between hepatic sinusoidal cells and passenger leukocytes **(MacPhee et al, 1995)**.

Physically, KCs protrude from the inside of the sinusoidal wall, a position that enables them to perform endocytosis for blood born material entering the liver, **(Arii and Imamura, 2000).**

They are extremely active in phagocytosis and they produce numerous soluble mediators such as cytokines, prostanoids, oxygen radicals and proteases these factors regulate not only the KCs that produce them but also the neighboring cells, such as hepatocytes, stellate cells, endothelial cells and other immune cells that pass through the liver **(Van de Water et al, 2003).**

One of the most important roles of the KCs is the clearance of circulating end toxins. In addition, they effectively clear viruses, bacteria, fungi, parasite as well as immune complexes, tumor cells, liposome's, iron and various other particles. Endotoxine (lipopolysacharides; LPS) is a potent stimulator of KCs, leading to the production of inflammatory mediators such as IL-1 and TNF-α , as well as oxygen radicals and proteases**(Van de Water et al`, 2003).**

Lymphocytes

Lymphoctes play a major role in immunosurveilliance against malignancy and infection. They can be broadly divided into B cells and T cells and natural killer cells, which collectively can detect and eliminate viruses, bacteria, multicellular parasites and tumor cells from the body, **(Doherty and O'Farrelly, 2003).**

Immunohistochemical staining of normal liver biopsy specimens has demonstrated that these lymphocytes are predominantly located around the portal tracts and they are also

found scattered throughout the parenchyma mediating routine immunosurveillant functions **(Norris et al, 1999).**

Hepatic B cells

B cells are characterized by their cell-surface expression of colontypic antigen receptors and immunoglobulin molecules that directly recognize conformational epitopes on antigenic molecules. Thus B-cells display extreme diverly in antigen recognition and provide the immune system with a large number of antigen-specfic effector cells. B cells produce antibodies that can neutralize toxins and pathogegs, opsonize pathogens for phagocytosis or cytotoxicity and activate complement for the lysis of bacteria, **(Doherty and Ofarrely, 2000).**

Hepatic T cells

T cells are the main members of adaptive immune responses. " Classical" T cells express antigen receptors (T cell receptors) (T C Rs), which consists of α and β chains complexed with the CD3 polyprotien, and recognize short peptide fragments of protein antigens that are processed within a cell and presented on cell surface complexed with a MHC molecule **(Abbas et al, 1996).**

Hepatic NK-T cells

A great attention is currently being focused on NK-T cells because they appear to play a crucial role in immunity against tumors, bacteria and viruses and in pathogenesis of auto immune disease **(Godfrey et al, 2000).**

Hepatic-γδ T Cells

Up to 15% of hepatic T cells express **γδ** TCRs, making the liver one of the richest sources of **γδ** T cells in the body **(Norris et al., 1999 and Tseng et al., 2001)**.

Dendertic Cells

Dendertic cells are bone marrow-derived cells located mostly in the periportal area and around the central veiv. They function as professional antigen presenting cells (APCs) expressing MHC class II antigens, **(Van de Water et al, 2003)**