SHOCK

ESSAY

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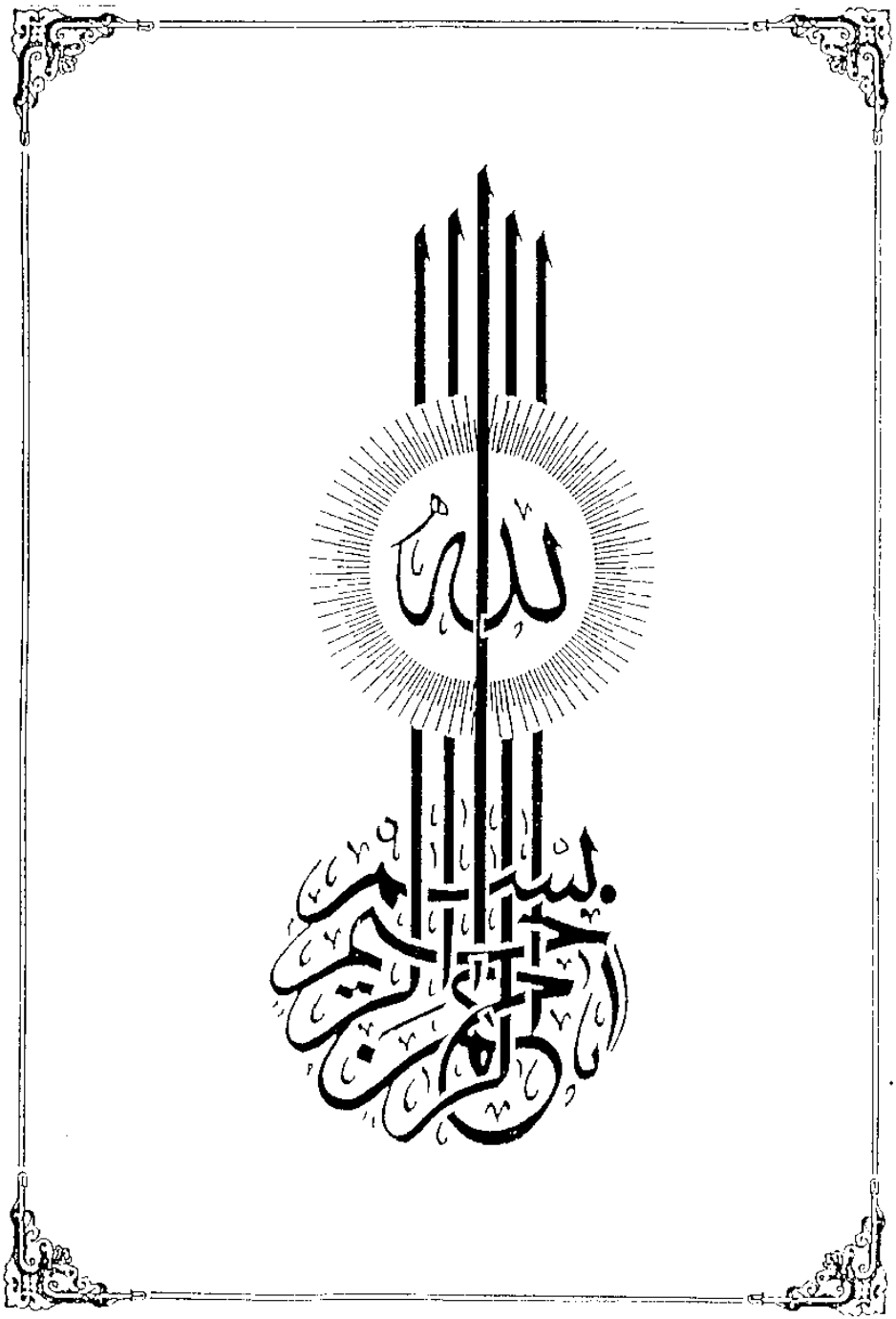
Dedicated

TO

The Memory of My

Father And Mother



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INTRODUCTION

SHOCK

INTRODUCTION

The term "shock" has been used to describe a wide variety of clinical states, and its usefulness is dependent on a precise description of the syndrome specifically involved.

(Anderson et al,1983)

The ward "shock" in english language means "collapse" derived from latin "collapsus" (Grolier I.Dictionary, 1981)

The nature of "shock" has been studied for some four centuries in an attempt to formulate rational therapy in terms of the body 's reaction to injury, and because of the inability of early observers to treat shock effectively, the condition was considered irreversible and was felt to imply impending death.But now with early diagnosis of shock appropriate treatment is well recognized and generally successful (Anderson et al, 1983)

Anderson et al, 1983 stated that the development of theories on the aetiology and treatment of "shock" is the story of the development of medical thought in general:

Paré (1582)first described the syndrome following battlefield trauma as "petite mort".But the ward "shock" was first used medically in 1743, by Henri Francoise Le Dran : (a reflection from experiences with gun shot wounds)

Because of a large number of traumatic injuiries that are seen in the battlefield, World Wars I and II have stimulated

the interest in the definition, investigation and treatment of "shock" and between these wars, the interest in the investigation of civilian shock states was maintained. Therefore, the elaborated efforts of Cannon and Bayliss (1919) created an improtant knowledge about traumatic shock,also Blalock (1930) and Parsons and Phennster (1930)working independentely challenged the concept of generalised vascular injury and traumatic toxaemia

The clinical application of cardiac catheterization in (1943) opened a new era in the investigation of shock,also the advent of coronary care units have more recentely resulted in intensive clinical study of cardiogenic shock

Since (1940) a large volume of haemodynamic and metabolic data has been collected from the patients with serious infections and septic shock was recognized.

More recent studies have provided new and intriguing concepts to the understanding of shock states and their haemodynamics, therefore, accurate and successful treatment became available

(Anderson et al,1983)

DEFINITION
CLASSIFICATION

DEFINITIN & CLASSIFICATION

The term "Shock" is applied to several quite different conditions, so it is important to start with a definition .
(Illingworth et al, 1983)

- Blalock (1940) defined "shock" as :
  (A peripheral circulatory failure resulting form a discripancy in the size of the vascular bed and the volume of the intravascular fluid)

- MacLean (1981) said that "shock" is :
  (A state of inadequate blood flow to vital organs or the inability of the body cell mass to metabolize nutrients normally)

Following World War I, shock was divided grossely into two types according to the interval between the injury and the decline in blood pressure, either immediate "primary shock" or delayed "secondary shock" (cowell, 1919)

Nowadays, primary shock is used to describe an acute bout of hypotension which may follow trauma, fright, or visceral stimulation. It is transitory and harmeless and is due to pooling of blood in the capacitance vessels (Walter, 1982)

In "1934" Blalock proposed the aetiological classification of the circulatory failure:

- Haematogenic (oligaemic)
- Neurogenic (caused primarily by nervous influences)
- Vasogenic (initially decreased vascular resistance and increased vascular capacity)
- Cardiogenic
  a. failure of the heart as a pump
  b. unclassified category (including diminished cardiac output from various causes)

In "1981" MacLean classified "shock" into :

A) Hypovolaemic shock : due to blood loss, plasma loss or water loss.

B) Cardiogenic shock: due to

- myocardial infarction
- arrhythmias
- late hypovolaemia
- tamponade

- epidural and general anaesthesia

C) Peripheral pooling:

-Loss of tone in resistance vessels

- Trapping in capacitance vessels

D)Septic shock :Failure of cells of vital organs to perform normal metabolic fuction despite availability of oxygen .

In "1983" Anderson et al, have chosen to classify shock by an extension of Blalock's original description and also that of Shires and collegues (1973) in order to incorporate more recent information on the factors contributing to the development of shock and low flow states.

I. **Cardiogenic Shock :**

A) Primary myocardial dysfunction :

- Myocardial infarction
- Cardiac arrhythmias
- Myocardial depression from other causes

B)Miscellaneous causes of impaired cardiac function :

- Tension pneumothorax
- Vena caval obstruction
- Cardiac tamponade
- Pulmonary embolus

II. **Hypovolaemic Shock :**

Blood loss, plasma loss or water loss or any

combination of the above three .

III. **Vasogenic Shock** :

Brought about by the specific disorders that result in decreased resistance :

A) Spinal anaesthesia
B) Neurogenic reflexes as in acute pain
C) Possibly end-stage hypovolaemic shock

IV. **Septic Shock** :

A) Change in peripheral arterial resistance .
B) Change in venous capacitance
C) Metabolic lesion (physiological shunting due to failure of oxidative phosphorylation)

However, it must be recognized that the use of this approach or any other classification based on the initiating event is limited as a static system by the transition of one variety of shock into another (Anderson et al, 1983).

In "1985" Shires, concluded that shock invariably results from loss of function of one or more of four separate but interrelated functions :

- The pump (heart)
- The fluid which is pumped (blood volume)
- Arteriolar resistance
- The capacity of the venous bed (capacitance vessels)

And these functions may be summarized as follows :

I. Cardiogenic shock : that implies failure of the heart as a pump .

II. Reduction in the fluid which is pumped (the blood volume)

III. Changes in resistance vessels which would include :

- -Decrease in resistance (e.g. neurogenic reflexes)
- - Septic shock

As we saw shock may be classified in several ways. The purpose of any classification is to facilitate recognition and to promot correct and specific therapy as quickly as possible (MacLean , 1981)

SURGICAL PHYSIOLOGY
PATHOPHYSIOLGY

SURGICAL PHYSIOLOGY

It is wise to clarrify the surgical physiology of circulation before going in discussion of the pathophysiology of shock .

The cardiovascular system :

Is composed of the heart, the blood and the blood vessels. These are divided into arteries, capillaries and veins .

-The large arteries and their branches down to the arterioles are the distribution .

- The arterioles and the terminal arterioles with the precapillary sphincters form the resistance vessels .

- The capillaries with the sinusoides form the exchange vessels.

- The veins are the capacitance vessels .

(Gray, 1973)