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**CLINICAL EVALUATION OF PIPECURONIUM BROMIDE
(ARDUAN) IN PATIENTS SUFFERING FROM RENAL
AND LIVER FUNCTION DISTURBANCES**

THESIS



Submitted for the partial fulfilment of
M.D. Degree in Anaesthesiology

By

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Introduction

Aim of the Work

AIM OF THE WORK

The aim of this work is to evaluate the duration of action of pipecuronium in patients with renal, liver dysfunction in comparison with its duration in normal patients.

Review of Literature

ANATOMY AND PHYSIOLOGY OF NEUROMUSCULAR TRANSMISSION

The neuromuscular junction holds particular importance to the anaesthetist with regards to peripherally induced muscle relaxation.

Anatomy of the Neuromuscular Junction

A motor nerve enters a muscle, then branches repeatedly depending on the function of that muscle. For example, muscles that perform fine movements are supplied by nerve fibres that innervate relatively few muscle fibres while muscles that are involved in the control of posture, are innervated by nerve fibres that supply many muscle fibres (*Bowman, 1980*).

In the human body, all muscles, with notable exception of extraocular muscles of the eye and some muscles of the face and neck, are focally innervated. In the muscles in which there are multiple innervation i.e. each muscle fibres passes many myoneural junctions, this muscle type responds to a depolarizing agent by contracture. As the axon forms intimate contact with a single muscle fibre, it loses its

myelin sheath and then branches again to form myoneural junction (*Anis Baraka, 1980*).

The nerve terminals lie in synaptic troughs and are capped with Schwann cells which may serve to mechanically preserve myoneural junction (Fig. 1).

The nerve terminals themselves contain vesicles of transmitter acetylcholine that line up in "active zones" within the nerve terminal. Also present in the nerve terminal are mitochondria which make up about 6.6% of the nerve terminal and cisternae which are thought to be involved in the recycling of the vesicles.

The synaptic cleft, about 50 to 70 nm wide, contains a basement membrane material. The enzyme acetylcholinesterase is also present in the synaptic cleft and is concentrated in the folds. The post-junctional region is immediately recognized by its folded surface the mouth of which be directly opposite the active zone in the nerve terminal. It is also in this region that the acetylcholine receptors and their associated ionic channels are located. Thus the released acetylcholine passes the receptors before being destroyed by acetylcholinesterase within the folds (Fig. 2) (*Heuser, 1973*).

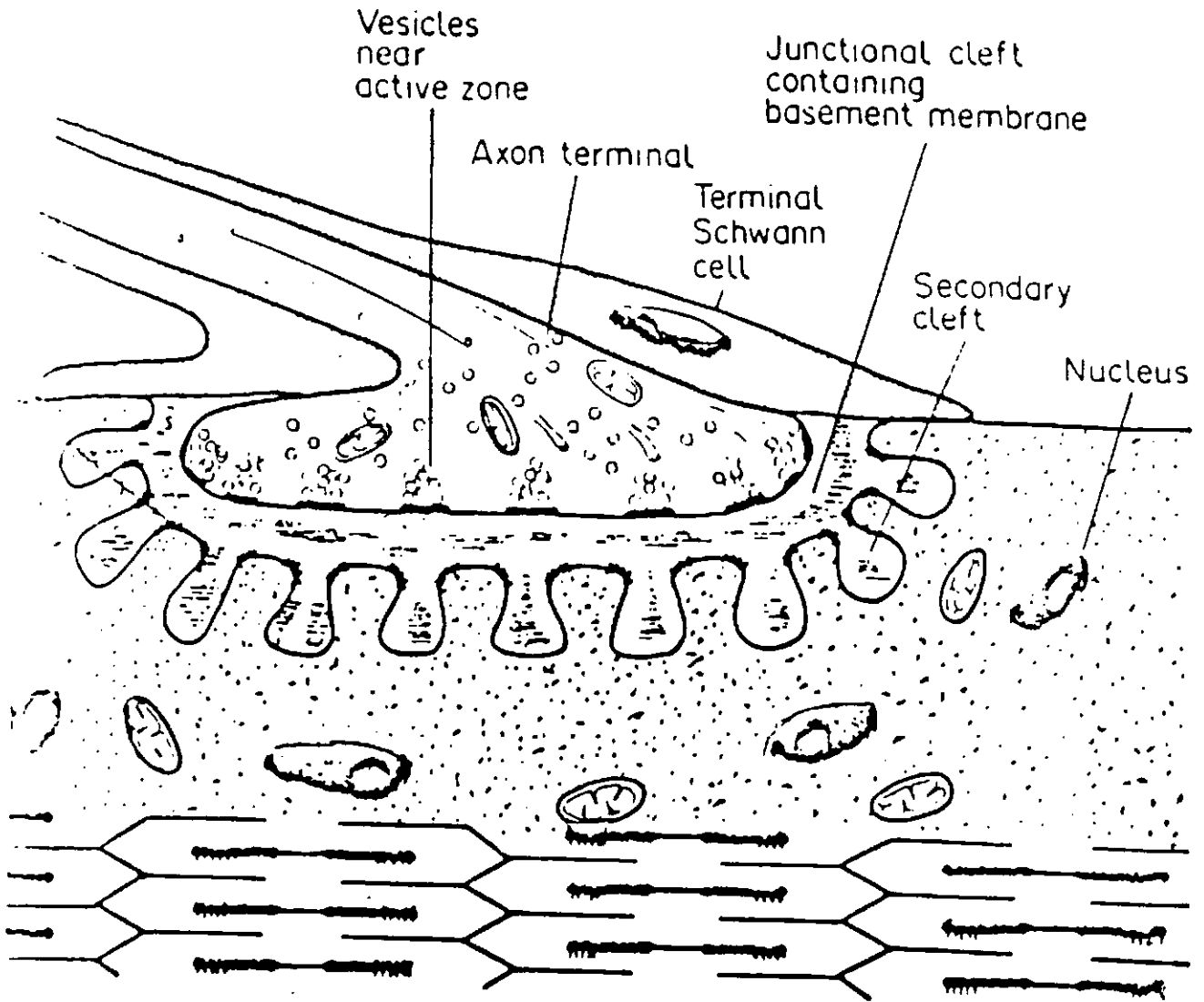


Figure (1): Scheme of the motor nerve ending (*Standaert, 1986*).