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Morphological changes in biologically active Point /BAP/ ST36 after acupuncture in rat

N. Dimitrov

Department of Anatomy, Faculty of Medicine, Stara Zagora, Bulgaria

Biologically active points (BAP) ST 36 is treated with various methods of Chinese medicine. One of the most used is acupuncture. The aim of this study is to clarify the effect of the acupuncture needle on the structure of the BAP ST 36 in rat by the use of classic histological techniques. The impact of the acupuncture needle in the BAT ST36 induces morphological changes in the tissues studied. The methods used allow to explore the construction of acupuncture needle channel and the changes induced by it. The seen defect has a minimal size and the living tissue fast recovers its integrity upon with drawl of the needle.

Key words: biologically active points (BAP), histology, rat, ST 36, Acupuncture needle.

Introduction

Changes that occur in the tissues under the influence of acupuncture needle is not sufficiently investigated [14].Research efforts are focused on the study of morphological features in acupuncture points [2, 6, 8], the role of connective tissue under the skin of the reflex response [10, 11], the construction of Mechanoreceptors at the cellular level [1].Special attention is paid to the morphological characteristics [9, 10] and the skin changes that occur in it by mechanical [7] and electrical [13] influences. Some authors seek identity between energy channels in humans and animals [4] and follow the general mechanisms involved in Ayurvedic and Chinese medicine [3].

Aim and objectives

Target of this study is using the classic histological techniques [15] to identify any changes that occur in the tissues under the influence of acupuncture needle.

Materials and Methods

Experiments

Were carried out on five adult normotensive rats, Wistar strain of either sex weighing ranging between 220 and 350 g. and 2 adult spontaneously hypertensive rats, (SHR) of

both sexes, weighing 180 to320g. The area around the BAP was epilated, defined and marked with the method of standard proportion of anatomical structures [5] under the control of the apparatus KWD-808 measuring skin resistance. The material was taken and treated without removing the needle for better visualization of the acupuncture channel. Samples are cut into freezing microtomes thickness 20 and 30 mm and paraffin slice thickness of 5, 7 and 10 mm. We used the following 6 stains: routine staining with Hematoxylin-eosin (H&E), a connective tissue with van Gieson (V.G), three colour staining by Mallory, Toluidine blue, the elastic fibers with Orcein, three colour staining by Masson.

Results

The tissue recover fast its integrity upon withdrawal of the needle and the channel is difficult to discern **Fig 1**.Clearly distinct channel from the prick is seen if the needle is kept in the tissue during its processing. In this case, the observed channel penetrates the dermis, subcutaneous connective tissue, fascia, and reaches the muscle, without affecting the deeper lying vessels. The integrity of the epithelium, subcutaneous loose connective tissue, the fascia and the muscle is damaged. **Fig 2** In the subcutaneous connective tissue partial destruction of elastic and collagen fibers is observed **Fig 3** and increased degranulation of mast cells in the acupuncture area **Fig. 4**. The cells are deformed, the intercellular distances are reduced, the glands and the hair follicles are pressed. Pressed and with reduced cross section blood vessels are found, rupture, deformation and sag of the epithelium and deep subcutaneous connective tissue and condensing of the loose connective tissue, and the lying in it cells, collagen and elastic fibers. **Fig 5**. Changes in the structure of loose connective tissue are most pronounced near the channel formed by the acupuncture needle, but also occur in adjacent areas of skin **Fig 6**. There is a minimal swelling in the area around the needle and some red blood cells in the nearby to the acupuncture channel tissues . In depth a large blood vessels could be found that are not affected by the needle **Fig. 7, 8, 9.**

Discussion.

The channel of the acupuncture needle penetrates the dermis, subcutaneous connective tissue, fascia, and up to the muscle without affecting the deep larger blood vessels. The skin defect remains visible when holding the needle into the tissue during its processing. The results obtained by other authors for two types of amendments: destruction in the channel caused by the needle and deformation in the adjacent layers and tissues are confirmed [12]. The nearest to the needle tissues are destroyed. Cells shape and position is altered, intercellular distances are reduced, the glands and hair follicles are presssed, blood vessels are deformed and their diameter is reduced. In depth larger vessels are found, which confirms the results of other authors [7, 13]. They are not affected and there were no major bleeding. Similar changes in the loose connective tissue are described in the literature [7]. We also detected degranulation of mast cells in the acupuncture area, which is confirmed by other researchers [12].

Conclusions

1. The influence of the acupuncture needle in the BAP ST36 induces morphological changes in the examined tissues. The defect seen is with a minimum size and the tissue integrity recovers fast after the removal of the needle.

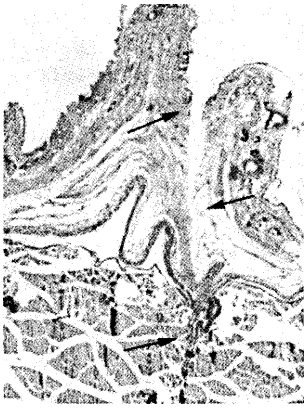

Fig 1. Acupuncture needle channel and deformation and sag of the epithelium, the fascia and deep subcutaneous tissue (arrow) (Mallory)

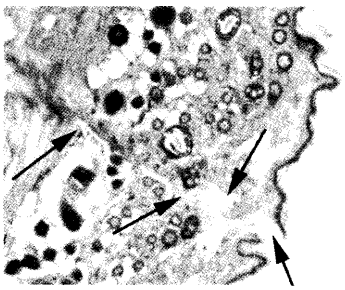

Fig 2. Acupuncture needle channel (arrow) and mast cells (toluidine blue)

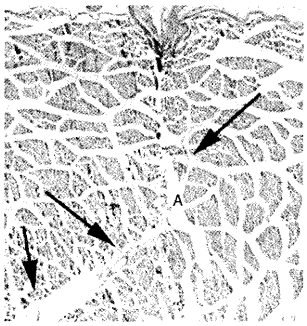

Fig 3. Acupuncture needle channel (A) and blood vessels (arrow) (Mallory)

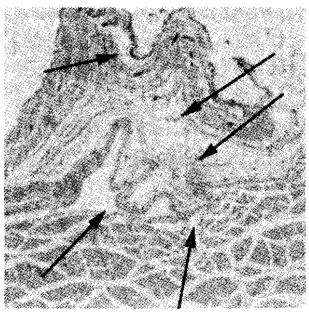

Fig 4 Deformation and sag of the epithelium and deep subcutaneous connective tissue near the channel formed by the acupuncture needle (arrow) (HE)

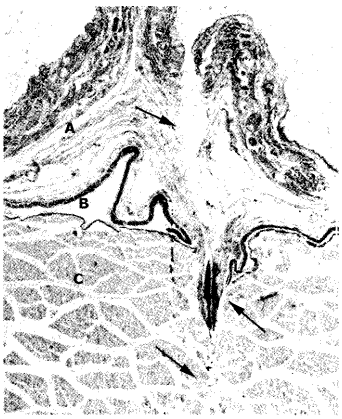

Fig 5. Acupuncture needle channel (arrow) (VG)

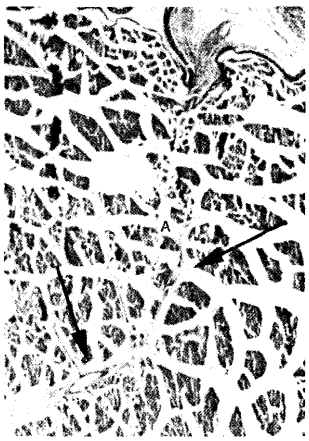

Fig 6. Large blood vessels (arrow) and acupunctureneedle channel (A) (Masson)

Fig 7. Destruction of elastic and collagen fibers (Orcein

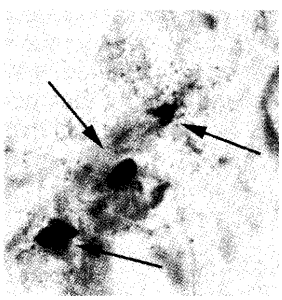

Fig 8. Degranulation of mast tissue (arrow) (Mallory)

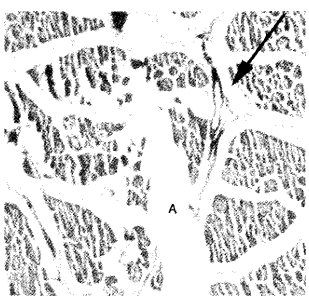

Fig 9. acupuncture needle channel (A) and blood vessels (arrow) (Mallory)

2. The main changes are related to the destruction and deformation in the adjacent tissues near the channel , accompanied by degranulation of mast cells in the prick area.

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