

Histological study of pars tuberalis of the pituitary gland in local male buffaloes "Bubalus bubalis".

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Summary

This study was carried out on the pituitary gland of eight male buffaloes 3-5 years old, examined under light microscope. The histological results revealed that the pars tuberalis contained four types of cells, not similar to any other cell types of the pars distalis. This finding and the location of the pars tuberalis at the gate of pars distalis which control the blood circulation give the pars tuberalis a special functional importance.

دراسة نسيجية للفص الحديبي للغدة النخامية في ذكر الجاموس المحلي "Bubalus bubalis"

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الخلاصة

اجريت هذه الدراسة على ثمان غدد لنخامية لذكور الجاموس المحلي بعمر (3-5) سنة تحت المجهر الضوئي لدراسة الفص الحديبي للغدة النخامية. أظهرت الدراسة النسيجية لأول مرة إن للفص الحديبي أهمية خاصة بسبب احتواءه على أربعة أنواع من الخلايا التي لا تشبه أي نوع من أنواع خلايا الفص الأمامي. علاوة على وقوع هذا الفص عند مدخل الفص الأمامي والذي يسيطر على مجرى الدم الذاهب إليه.

Introduction

The pars tuberalis forms a sleeve around the stalk of infundibulum. Its thickness is 25-60 μ m. It consist of highly vascularized cord, of epithelial cells, in human, pars tuberalis is not known with certainty (1,2 and 3). Onotherhan(4 and 5) stated that the cells of pars tuberalis were arranged in short clusters or cords and may be found as nests of squamous cells and small follicles. Lined with cuboidal cells whose function was unknown. Many authors found that the cells of pars tuberalis were a granular and arranged in columnar clusters (6 and 7). Other authors described the cells of pars tuberalis as roughly cuboidal with no cytoplasmic granules with mild basophilic cytoplasm (8, 9 and 10). Some author classify three types of pars tuberalis i:e pars tuberalis- specific cells,also pars distalis –like cells and the follicular cells which are smaller than the pars tuberalis- specific cells and similar to follicle- stellate cell of pars distalis (2, 11, 12, 13 and 14)..Junqueire and Paul(15and16) reported that most cells of pars tuberalis secrete gonadotropin, follicle – stimulating hormone (FSH) and Leutinizing hormone (LH).Peter(6) found the presence of melatonin receptors on the pars tuberalis. Due to the location of pars tuberalis at the gate of pars distalis and the paucity of the histological researches on the part of pituitary gland, this study was prepared.

Materials and Methods

Eight pituitary glands were used for histological study of the pars tuberalis of the local male buffaloes of 3-5 years old. The samples were obtained from Fudhailya abattoirs the samples were immediately removed and fixed in 10 % buffered neutral formalin. Routine histological techniques were done on the samples. Periodic-acid shiff (PAS) reagent were used for staining

(17). The samples were examined under light microscope. Ocular micrometer was used for measurements. Analysis of data were done according to(18).

Results

The present study found that the pars tuberalis encircled the infundibulum of neurohypophysis. Firstly, the present study recognized four cell types:

- 1- Light cells:** Large pale polygonal or cuboidal cells with clear boundaries. The cytoplasm was devoided of granules with rounded to oval nuclei and prominent nucleoli. The average diameter of the cell was 21 μm (fig. 1).
- 2- Magenta- syncytial cells:** The cellular limits were unobvious. The syncytium loaded with ovoid or irregularly triangular nuclei with dark chromatin. The syncytium filled with fine purple granules (Fig. 2).
- 3-Double squamous cells:** This type of cells lied at the periphery of the pars tuberalis and encircled the pars nervosa, it consisted of two layers of small squamous cells with fine magenta secretion granules similar to that of the magenta- syncytial cells. (Fig. 1).
- 4-Water- clear cells:** There are two types of cells, small and large, spherical. It was smaller than the light cells, found in a small number. It has a pale water- clear empty cytoplasm with dark spherical to ovoid nuclei. The average diameter was (10.5 – 14) μm . (Fig. 2).

Discussion

The presence of four types of cells in the pars tuberalis give it a special functional importance. Two types of these cells contain fine purple secretory granules with prominent nucleoli that may indicate a special metabolic and hormonal activity. The classification of these cells in the present study differ with that of (13 and 14). A number of factors, among which, the presence of pars tuberalis at the gate of adenohypophysis, its juxtapositioned to the blood circulation of the hypophyseal portal system, the difference of their cell types to that of the cells of adenohypophysis and the presence of a variety of cell types among which the high secretory activity of syncytial cells. All the foregoing considerations give an exclusive importance to the role of pars tuberalis and creating the impression that the pars tuberalis was not. Just as ordinary gland which secretes one or two types of hormones (10 and 19) and give another impression that the pars tuberalis may secretes a special type of enzymes or hormones not related to the secretory function of adenohypophysis, otherwise have a relation with blood circulation and blood pressure. This study suggested that this enzyme may be the renin as it is a glycoprotein which shares other hormones in controlling blood pressure as the histological sections of the present result showed PAS positive secretory granules. The results agree with (6, 11 and 20) whom give an importance role of the pars tuberalis. The present result in contrast with 5 who described the squamous cells as nests and with(6and 7) whom referred to the cells of pars tuberalis as columnar clusters. But it confirm the result of(8, 9 and 10) whom explained that the cuboidal cells of pars tuberalis contain no cytoplasmic granules. It seems that the pale cuboidal cells may be loaded with glycogen to serve as energy source in regulating the blood circulating – hypophyseal portal system, as the sites occupied by glycogen appear often as clear empty areas (4 and 11). Instead of the capsule, the aggregated double layers of squamous surface epithelium constitute the external surface of the pars tuberalis. Epithelial cells are specialized for a variety of different functions, among which are protection, secretion, absorption, excretion and barrier for selective permeability. The squamous cells closely apposed and adhere to one another by mean of special junction (21). It was difficult to measure the diameter of the magenta- syncytial cells because their limits were unclear.

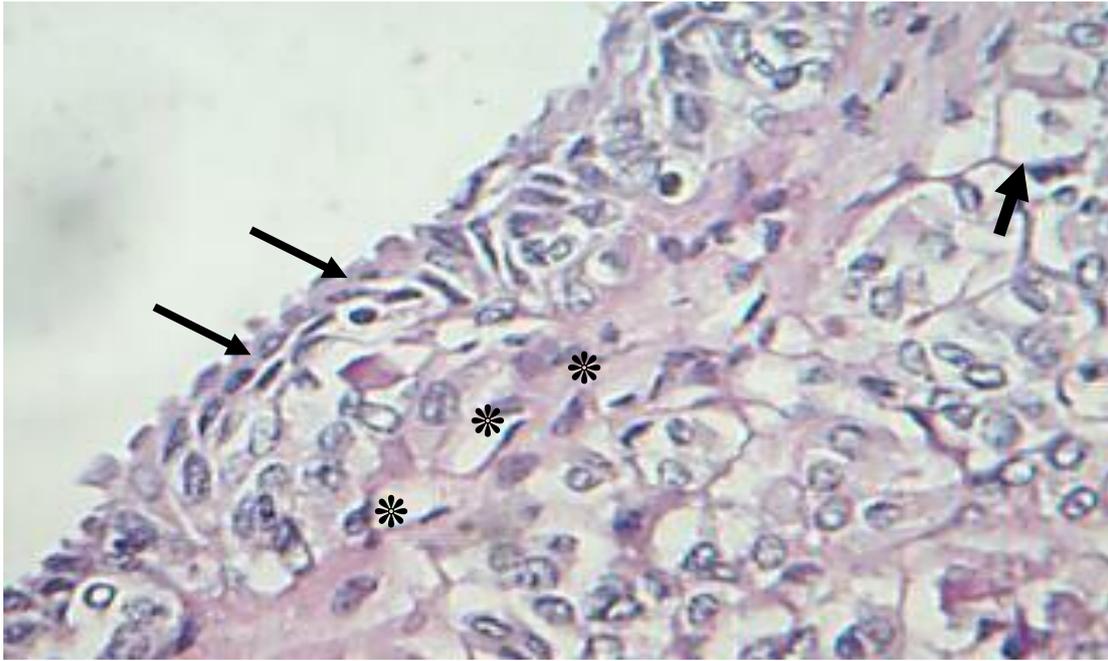


Fig.(1). Pars tuberalis in buffalo showing light cells (small arrow). Double squamous cells (large arrows). Hypophyseal portal system (asterisks). PAS stain. 40 X.

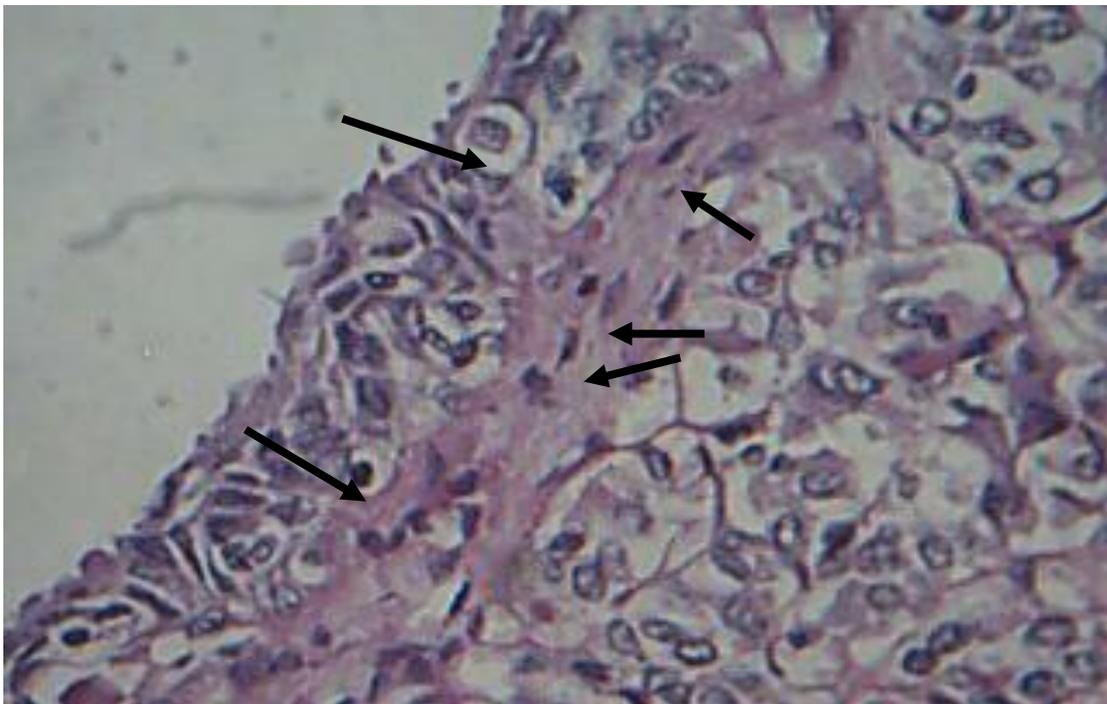


Fig. (2). Pars tuberalis in buffalo showing water-clear cell (large arrows) and magenta syncytial cell (small arrows). PAS stain. 40X.

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