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PERSPECTIVE

Plurihormonal Pituitary Adenoma: Clinicopathological Features

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Description

Clinicians still struggle to diagnose Plurihormonal Pituitary Adenoma (PPA) since the diagnosis criteria are imprecise and variable to examine the connection between the pathological and clinical aspects of PPA.

In addition to growth hormone/prolactin or follicle-stimulating hormone subunit/luteinizing hormone -subunit, Plurihormonal Pituitary Adenoma (PPA) is a kind of pituitary adenoma that expresses two or more types of pituitary adenoma hormones. PPA produces a variety of hormones. However, one type of hormone is frequently expressed in the therapeutic setting, or patients show no symptoms. PPA has historically been misdiagnosed frequently as a result of subpar diagnostic methods. The number of patients with a diagnosis has increased as a result of the development of technologies like electron microscopy, immunoelectron microscopy, and immunohistochemistry, as well as a better understanding of this malignancy.

Clinicians still struggle to diagnose PPA because of its uncertain pathophysiology and variable diagnostic standards. Currently, the majority of PPAs are identified using the following criteria: (1) clinical signs and endocrine activity, (2) imaging and intraoperative findings, (3) histology, (4) immunohistochemistry, and (5) ultrastructure. Retrospective analysis was done on the clinical information of PPA patients who were hospitalised to our department between 2008 and 2010.

Additionally, information on the clinical, imaging, and laboratory exams was gathered. The following were the inclusion requirements: Patients who (1) had thorough pituitary magnetic resonance imaging and serum endocrinology testing before surgery and (2) who had tumour tissue, sellar dura, and sphenoid sinus mucosa samples collected during surgery examined pathologically and immunohistochemically and who have a thorough pathological report. Additionally, a prospective analysis of the imaging and laboratory examination data of patients who received a pituitary adenoma diagnosis between 2019 and 2020 was conducted. Since 2020, only three patients' immunohistochemical staining of Pit-1, SF-1, or T-pit revealed transcription factor results. To identify tumour cell secretion, tumour tissues underwent primary culture.

It is still up for debate whether PPAs can be diagnosed based on clinical symptoms, serum hormone levels, and HE staining results. The identification of all pituitary hormone components in tumour cells using immunohistochemistry techniques is advised by certain academics. It is still up for debate whether PPAs can be diagnosed based on clinical symptoms, serum hormone levels, and HE staining results. The identification of all pituitary hormone components in tumour cells using immunohistochemistry techniques is advised by certain academics. The hormone released by the tumour may not be physiologically active or may have lost biological action after entering the bloodstream. Three patients also required multiple surgeries because of relapses, and the immunohistochemistry findings were inconclusive. Therefore, it is still debatable whether immunohistochemistry alone can accurately diagnose PPA.

Based on transcription factors and differentiation drivers in the differentiation pathway of pituitary cells, there is most recent classification of pituitary cancers. They do not, however, entirely capture the various endocrine abnormalities found with PPA. The diagnosis of PPAs is still debatable at this time, and using serum hormone levels, clinical symptoms, and pathological findings by themselves is insufficient. Few varieties of multihormonal adenomas are also challenging to diagnose. A reliable diagnostic technique is hormone analysis utilising tumour cell supernatant grown *in vi-*

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tro. Pituitary adenoma cells' primary culture has been evaluated in numerous researches. Furthermore, prior research has shown that the hormones released *in vitro* by pituitary adenomas frequently differ from those shown in immunohistochemistry and serology. Consequently, *in vitro* primary tumour culture is crucial for vital for analysing the development, diagnosis, and treatment of cancers, as well as their causation.

According to some researchers, PPA undergoes a pathological assessment and is thought to arise from specific cells during the early stages of the pituitary gland's normal development. The origin idea of stem cells was unable to fully explain the aetiology of PPA. As a result, further research needs to be done on the pathophysiology and tumour origin of PPA. A big adenoma with an aggressive biological behaviour is a typical feature of PPA. Patients with PPA who have tumour samples that have undergone immunohistochemistry have positive results for several hormones. It did, however, show up as elevated levels of the relevant serum hormones and clinical symptoms, although only one elevated serum hormone or a non-functioning condition showed up as endocrine symptoms. Clinical symptoms, blood hormone levels, tumour immunohistochemistry staining, and hormone assessment are frequently used to diagnose PPA.