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Eosin-related fluorescence of acidophil pituitary cells

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Summary. The examination of haematoxylin and eosin stained sections of normal and neoplastic pituitary glands under ultraviolet light illumination discloses fluorescence of acidophil cells. The distinction between prolactin and growth hormone-producing cells is not possible. Such fluorescence depends on previous eosin staining.

Key words: Autofluorescence, Eosin related fluorescence, Pituitary gland, Acidophil cells

Introduction

The examination of haematoxylin and eosin stained sections under ultraviolet light may demonstrate fluorescent structures. This phenomenon has already been ascribed to pigments (Culling, 1957), elastic fibers (Culling, 1957), fungi (Friedman and Raick, 1984; Gonzalez et al., 1984; Graham, 1983; Mann, 1983; Pappola and Radice, 1984), myocardial infarct (Carle, 1981; Overbeck et al., 1986), altered hepatocytes (Dervan, 1984; Friedman et al., 1976), Kaposi's sarcoma (Senba, 1985), and yolk sac tumor (Senba, 1985).

In the present paper, we report the fluorescence of eosinophilic cells in the normal and neoplastic pituitary gland.

Materials and methods

We examined 5 normal pituitary glands from our necropsy files and 10 acidophil adenomas obtained at surgery.

In each case, haematoxylin and eosin stained sections were examined conventionally and for fluorescence using a Zeiss microscope supplied with a partly transmitting reflector and bright field VZ condenser, allowing comparison of the same microscopical field under both ultraviolet and ordinary white light illumination (Friedman et al., 1976).

Sections from adenomas were also submitted to immunohistological reactions for growth hormone and prolactin employing the peroxidase antiperoxidase (PAP) method (Taylor, 1978) and specific antisera commercially available (Dakopatts).

Results

The acidophil cells in both normal pituitary glands and hypophyseal adenomas exhibited an intense and granular cytoplasmic orange-yellowish fluorescence (Figs. 1, 2). The recognition of the cell type was accomplished by the examination of the same microscopical field under ordinary white light illumination.

The amount of fluorescent granules varied from cell to cell. When scarce, the granules occupied mainly the cell periphery whereas a diffuse cytoplasmic distribution occurred when they were abundant. Some cells showed an «explosive» pattern, discharging granules into the intercellular space.

The fluorescence permitted the prompt recognition of faintly stained acidophil cells, the latter hardly being identifiable as such under the ordinary light microscopy.

Both growth hormone positive and prolactin positive cells yielded the same pattern of fluorescence, and distinction of the two cell types through fluorescence was not feasible.

Other cell types did not exhibit fluorescence.

Unstained sections did not yield fluorescence of acidophil cell. Therefore, previous eosin staining was necessary for the emergence of fluorescence.

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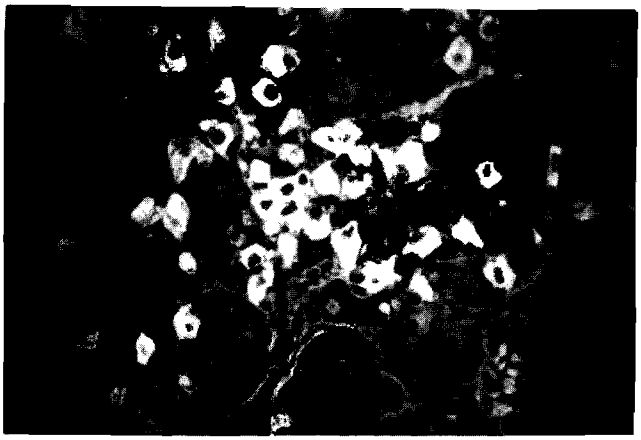

Fig. 1. Fluorescent acidophil cells. Pituitary gland. H & E stain. Fluorescence microscopy. × 320

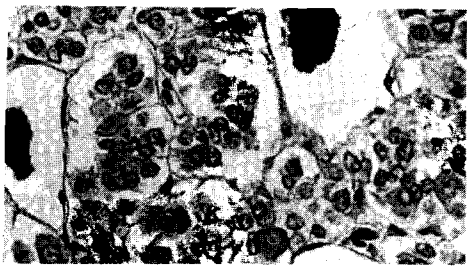

Fig. 2a. Normal pituitary gland. H & E stain. × 320

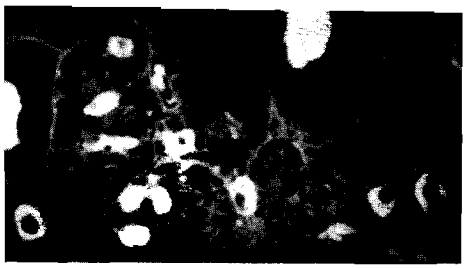

Fig. 2b. Same field under fluorescence microscopy. × 320

Discussion

Haematoxylin and eosin fluorescence or autofluorescence as it has also been called, has recently been employed as a diagnostic tool in myocardial infarction (Carle, 1981; Overbeck, 1986), hepatic diseases (Dervan, 1984; Friedman et al., 1976), and fungal infections (Friedman and Raick, 1984; Gonzalez, 1984; Graham, 1983; Mann, 1983; Pappolla, 1984).

Eosin is a derivative of fluorescein (Senba, 1985) and the fluorescent structures in haematoxylin and eosin stained sections are usually eosinophilic. Nevertheless, some of these substances fluorescence even in unstained sections (Senba, 1985) and the designation autofluorescence should be more properly used only in the latter situation. For the circumstances in which the fluorescence depends on previous eosin staining, a term such as «eosin-related fluorescence» should be preferred.

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References

Carle B.N. (1981). Autofluorescence in the identification of myocardial infarcts. Hum. Path. 12, 643-646.

Culling C.F.A. (1957). Handbook of histopathological technique. Butterworth & Co. (Publischers). Ltd. London. p 421.

Dervan P.A. (1984). Alpha-1-antitrypsin hematoxylin and eosin fluorescence: a rapid, useful screening technic. Amer. J. Clin. Path. 82, 188-190.

Friedman H., Friedman I.V.C. and Mendoça J.S. (1976). Autofluorescent hepatic particles in HBsAg seuro-positive patients. Rev. Inst. Med. Trop. São Paulo 18, 459-462.

Friedman H. and Raick A.N. (1984). Autofluorescence of South American Blastomycosis less sensitive than stain. Amer. J. Clin. Path. 81, 540.

Gonzalez M.F., Brown R.W. and Bhatal P.S. (1984). Fluorescence of fungi-not autofluorescence. Amer. J. Clin. Path. 81, 142.

Graham A.R. (1983). Fungal autofluorescence with ultraviolet illumination. Amer. J. Clin. Path. 79, 231-234.

Mann J.L. (1983). Autofluorescence of fungi: an aid to detection in tissue sections. Amer. J. Clin. Path. 79, 587-590.

Overbeck J., Saraga P. and Gardiol D. (1986). An autofluorescence method for the diagnosis of early ischaemic myocardial lesions. Virchows Arch. (Pathol. Anat.) 409, 535-542.

Pappolla M.A. and Radice J.C. (1984). Fungal autofluorescence. Amer. J. Clin. Path. 81, 407.

Senba M. (1985). Autofluorescence of eosinophilic globules in Kaposi's sarcoma. Arch. Pathol. Lab. Med. 109, 703.

Taylor C.R. (1978). Immunoperoxidase techniques. Practical and theoretical aspects. Arch. Path. Lab. Med. 102, 113-121.

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