PITUITARY BRIGHT SPOT : INCIDENCE IN ROUTINE BRAIN MRI STUDYING IN THAI PEOPLE

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ABSTRACT

The brain MRI of 215 patients referred to our department without signs and symptoms relating to pituitary gland were studied. In each case, two to three images of the mid-sagittal region from routine brain protocol of the sagittal $T_{1\text{-wi}}$ were selected to determine the posterior bright spot of the pituitary glands. The age distribution of the patients which had been studied, were as followed : 0 - 12 years ; 73, 12 - 20 years ; 17, and more than 20 years ; 155 respectively. The incidence of the posterior bright spot, we found were 39 in 73 of the 0 - 12 years age group, 15 in 17 of the 12 - 20 years age group and 122 in 155 of the group aged more than 20 years. No significant differences in the detection rates of the posterior bright spot in different age groups ($x^2 = 0.05$). The total detection rate of the bright spot for the total study of 215 patients is 82 %

Key word : Posterior bright spot, Pituitary gland, MR Imaging.

Magnetic resonance imagings (MRI) of the pituitary gland is now the optimal technique for imaging this region. MRI has opened the new era for studying pituitary lesion as well as for studying of its function. The posterior lobe or neural lobe has been localized by MRI as the "bright spot" on $T_{1\text{-weighted}}$ image. However, it is not detected in some healthy patients. In this paper, we studied the detection rate of the "bright spot" in normal Thai patients by routine MRI protocol for brain and the significance of age distribution for the detection rate.

MATERIALS AND METHODS

The retrospective study of MRI brains of 215 Thai patients in our department was done. All were undergone routine MRI for other clinical indications that were not from pituitary lesion and no history of diabetes insipidus or other pituitary hormonal dysfunction. The two to three images in mid-sagittal region of brains from sagittal TSE-$T_{1\text{-wi}}$ were studied. Images were acquired with a standard head coil, 256 x 256 matrix, 23 cm. field of view, 6 mm. thickness, TR = 450 - 550 msec. and TE = 12 - 15 msec. with 2 excitations. The rates of identification of posterior high signal intensity or "bright spot" of the pituitary gland were statistically calculated using the chi-Square (X^2-test) to test the relationship of the detection rate and age group and the total detection rate.

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RESULTS

The 215 patients were devided into three groups by age : 0 - 12, 12 - 20, and more than 20 years old. The detection rates of the posterior bright spot in each age group are demonstrated in table I. The total detection rate is 82 %. There is no relationship between detection rate and age group ($p = 0.05$).

DISCUSSION

Mark et al[7] first reported the high signal intensity or bright spot in the posterior part of the sella turcica. They considered it to represent a "fat pad". Shortly thereafter, Fujisawa et al[3,4] in 1986 proposed and provided evidence from $T_{2\text{-wi}}$ and chemical shift experiments that the signal from the bright spot arose not from fat but from water protons in the neural lobe. They also postulated that the source of the bright spot should be related with the amount of neurosecretory granules of the hypothalamohypophyseal axis. They found the bright spot in all of their normal adults. However, other reported some detection rates of from 60 - 90 % in healthy person[2]. The detection rate can be increased by using multiplanar imagings, contiguous sections and strict anteroposterior orientation of the readout gradient. The detection rate of our series was studied from the routine cranial MRI and agreeable with other previous reports. We also found that no significant difference for the detection rates in various age groups. We believe that if careful imaging is done, the bright spot should be found in all patients regardless of the age group.

Patients with diabetes insipidus were found to have absent bright spot in the posterior lobe or arrested bright spot in the infundibulum or median eminence.[1,3,5,6] In our unreported 8 cases with suspected central DI, no posterior bright spot was found in all cases. However, we won't conclude that the abscence bright spot in routine cranial MRI means the disease. But if the patient has the history of central DI, the abscence of bright spot should be considered significant and careful imaging of the pituitary gland is recommended.

Table I : Detection rate of bright spot by age.

Aged (years old)	Number of patients	Number of bright spot (%)
0 - 12	73	39 (53.4 %)
12 - 20	17	15 (88.2 %)
> 20	155	122 (78.7 %)
Total	215	176 (82 %)

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