

Posterior Pituitary Bright Spot – A Study in Coastal Karnataka

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A B S T R A C T

Introduction: The posterior part of the pituitary gland is known to depict a bright spot, evident on T1 sequence. The absence of T1 hyperintense spot in the posterior pituitary has generally lead to the search of ectopic pituitary, pathology of the posterior pituitary gland. However many studies have shown that the absence of the posterior bright spot can be found incidentally in patients with no symptoms on routine imaging for other pathologies. Hence the need for this study to study the incidence of posterior pituitary bright spot in the sample population of coastal Karnataka.

Material and methods: A retrospective study was conducted wherein 300 MRI brains were studied and the posterior pituitary bright spot was examined for its presence. The studies were done as part of disease course of patients presenting to our hospital, patients with sellar disease or post op cases in the sellar region were excluded. The studies were performed on PHILIPS achieve 1.5 T machine and the sagittal images, 1.5-2.5mm thickness were examined.

Results: In our study 300 MRI brains were studied, 189 where males (63%) and 111 where females (37%). Of the female population, all showed presence of the pituitary bright spot (100%). In the male population, one patient showed no posterior pituitary bright spot, Rest of the male population ie 188 (99.5%) showed e/o of the pituitary bright spot. In total 99.6% ie 299 out of 300 patients showed e/o of the pituitary bright spot.

Conclusion: We conclude in our study, 99.6% of the sample population in our study showed e/o of the pituitary bright spot, one patient did not show the posterior pituitary bright spot, which could be a normal variation.

Keywords: Intracranial, Sellar Imaging, Posterior Pituitary Bright Spot, Brain MRI.

INTRODUCTION

The pituitary gland is one of the most important gland in the body, which plays a part in many functions and regulations of systems of the body. The pituitary gland is divided into anterior and posterior parts.^{1,2} The anterior gland consists of pars distalis, tuberalis and intermedia. The posterior gland consists of neurohypophysis.^{1,2} The posterior pituitary develops from the diencephalon, vis the axons in the hypothalamus, receives oxytocin and vasopressin.³

The posterior part of the pituitary gland is known to depict a bright spot, evident on T1 sequence.⁴ Previously this bright spot was thought to be because of extraglandular fat present in the intra sellar region.⁵ However further studies stated that it is the posterior pituitary showing the bright spot.⁷⁻¹⁰ This T1 hyperintense signal is due to the presence of Vasopressin, due to its T1 shortening effect.^{3,4} Other causes T1 hyperintense signal within the sella include, post operative changes, sellar lesions, haemorrhage, Rathke cleft cyst.⁶

The absence of T1 hyperintense spot in the posterior pituitary has generally lead to the search of ectopic pituitary, pathology of the posterior pituitary gland.^{4,7} However the pituitary bright spot cannot be indentified in all patients, is found to about 50-100% in healthy individual.^{4,7,10}

Hence the need for this study was to study the incidence of

posterior pituitary bright spot in the sample population of coastal Karnataka.

MATERIAL AND METHODS

The study was conducted on 300 patients in the district of Dakshin Kannada who underwent MRI brain as part of the disease course for which they had presented to our hospital. The study was conducted in the department of Radio-Diagnosis of Father Muller Medical College Hospital, Mangalore, Karnataka. The study was done over an approximate period of 1 years from January 2019 to December 2019.

Inclusion criteria

- All patients who underwent MRI brain in the study period.
- Patients of all age groups where included in the study.

Exclusion criteria

- Those with movement artifacts where images were not diagnostic.
- Those with intracranial lesions/ lesions in sellar region.
- Post surgical cases involving the sellar region.

MRI Protocol

The machine used in our study was that of PHILIPS achieve

1.5T.

Sagittal T1 sections of the brain, thickness of 1.5-3.5mm were studied retrospectively in patients whom MRI brain was performed as part of disease course. Posterior pituitary bright spot was identified by the presence of a hyperintense focus in T1 in the posterior aspect of the pituitary gland (fig-1,2).

STATISTICAL ANALYSIS

Descriptive statistics, mean and percentages were used for analysis. Data was analysed by descriptive statistics using Statistical Package for Social Sciences (SPSS) 16.0 version. Percentage frequency distribution was also used.

RESULTS

In our study 300 MRI brains were studied, 189 where males (63%) and 111 where females (37%) (Table 1).

3 patients in excess of the above 300 MRI brains were excluded from the study due to incidental finding of a sellar mass. Majority of the male population underwent MRI brain for headache and raised blood pressure, and about 55% belonged to the age group of 50-60 years (105 patients). Majority of the female population underwent MRI brain for headache and vertigo, and about 52% belonged to the age group of 40-50 years (58 patients). Of the female population, all showed presence of the pituitary bright spot (100%). In the male population, one patient showed no posterior

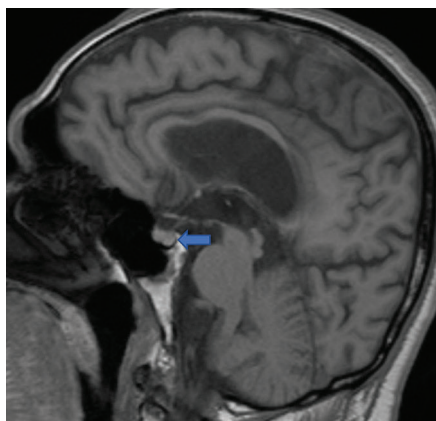


Figure-1: Arrow shows absence of posterior pituitary bright spot.



Figure-2: Arrow shows presence of posterior pituitary bright spot.

	Male	Female	Total
Number (n)	189	111	300
Percentage (%)	63	37	100

Table-1: Gender wise distribution of sample population

	Male	Female	Total
Number (n)	189	111	300
Percentage (%)	63	37	100
Posterior pituitary bright spot present	188	111	299
Percentage (%)	99.5%	100%	99.60%

Table-2: Number of patients with presense of pituitary bright spot.

pituitary bright spot (, Rest of the male population ie 188 (99.5%) showed e/o of the pituitary bright spot (Table 2).

DISCUSSION

Our study was conducted in Father Mullers Medical College, Mangaluru, where in 300 MRI brains were studied for presence of the posterior pituitary bright spot. Our study showed that 99.5% of the population in our study showed presence of the posterior pituitary bright spot, with 100% females and 99.6% of the males showing e/o of the posterior bright spot. Many studies conducted in the past attributed the absence of the posterior pituitary bright spot to diseased state ie ectopic pituitary, sellar mass lesions etc. However more recent studies have stated that the absence of the posterior pituitary bright spot can be a normal incidental finding in the general population with a variation of 50-100%.^{3,9} Brooks et al¹⁰, in his study stated that there was age related decline in the pituitary bright spot, we did not find any significant reduction in pituitary bright spot in our study. Brooke et al¹⁰ in his study, stated that in some cases the T1 marrow hyperintense signal of the clivus can show difficulty in discerning the posterior pituitary bright spot, in such cases the parasagittal images where better to examine. We agree with his observation, as we found similar cases wherein the marrow signal and posterior bright spot where close to each other and caused difficulty in interpretation.

Côté et al⁴ in his study stated that the posterior pituitary bright spot was visible in 99.7% of his cases. His was a female predominant study, however his study included patients with suspected pituitary dysfunction. His study included 107 patients and was performed on a 1.5 T with 3mm slice section or 3T MRI machine with 3mm slice thickness. Our study comes close to the results. However he stated in his study that all patients must show the posterior bright, in absence of which pathology must be looked for. Colombo et al⁷, studied 200 MRI brains, He stated that 90% of individuals have the pituitary bright spot and absent in 10% healthy individuals.

CONCLUSION

In our study we conclude that about, 99.6% of our sample population in coastal Karnataka showed e/o of the pituitary bright spot, in the isolated case of absent pituitary bright spot, the finding was incidental and could be a normal variation.

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