THE DIAGNOSTIC ROLE OF CHOLINE TRANSPORTER AND CALRETININ IMMUNOHISTOCHEMISTRY IN HIRSCHSPRUNG DISEASE: A COMPARATIVE STUDY

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INTRODUCTION

Hirschsprung's disease is an ENS malformation, with absence of intrinsic gangliain the distal rectum and a variable length of proximal bowel. Microscopic picture in H&E stained slides include absence of ganglion cells in muscularispropria and submucosa, and hyperplasia of cholinergic nerves & neurites.

Diagnosis is challenging as, it needs hard boring examination of numerous sections of the tiny suction biopsy which lake the deep submucosa & muscularispropria where the ganglion cells are abundant, searching for ganglion cells which has a normal sparse nature in the distal 1-2 cm of the rectum. So we need ancillary techniques to help in diagnosis and make it easier, previously it was used AChE EHC which needs fresh frozen sample & CR IHC.

Here we study Choline Transporter IHC to be a surrogate for AChE EHC with the advantage of being used with FFPE tissue sections, and to help in cases with misleading calretinin results.

AIM OF THE WORK

The aim of this study was to evaluate and compare the significance of immunohistochemical expression pattern of Choline Transporter (ChT) and Calretinin (CR) in the diagnosis of Hirschsprung disease and to correlate it with other pathological features of the disease.

MATERIAL AND METHODS

MATERIAL:

Fifty retrospective pull through cases of Hirschsprung disease retrieved from the archives of the pathology department, faculty of medicine, Alexandria university from June 2015 to June 2017.

METHODS:

Clinical data collection; age, sex, history and pathology reports.

H&E stained slides of all studied cases were revised for presence or absence of ganglion cells, thickened hyperplastic nerve bundles.

We take two coated slides from each case for (ChT) and (CR) IHC staining, and on each slide there are two sections one from ganglionic part of specimen and the other from aganglionic part.

Nuclear and cytoplasmic staining of Calretinin in ganglion cells was considered positive. Absence of nuclear and cytoplasmic staining was considered negative. Sparse immunoreactivity was considered equivocal.

Choline Transporter cytoplasmic and membranous staining in immunoreactive nerves and neurites was considered positive. Either no or very sparse thin immunoreactive neurites was considered negative. Moderate sized immunoreactive nerves in the mucosa, which were fewer and generally smaller in caliber was considered equivocal.

Sensitivity, Specificity, Positive and negative Predictive value, Accuracy was calculated between Choline transporter and Calretinin.

RESULTS

Table 1: Statistical analysis of calretnin IHC & Choline Transporter IHC

	Calretinin	Choline Transporter
Sensitivity	95.74	90.0
Specificity	100.0	95.56
PPV	100.0	94.74
NPV	96.08	91.49
Accuracy	97.92	92.94

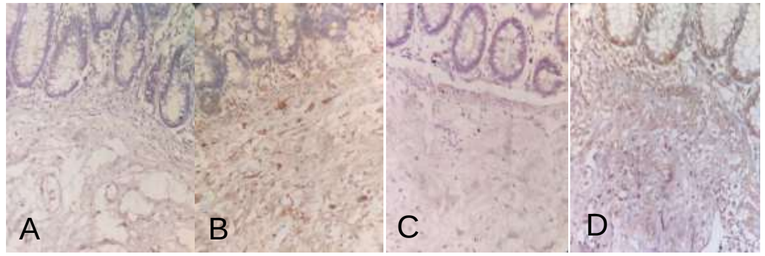

Figure: Calretinin immunostaining in Aganglionic segment (A), and in Ganglionic segment (B).
Choline Transporter immunostaining in Ganglionic segments (C), and in Aganglionic segments (D).

CONCLUSION

- CR IHC staining is the most effective and statistically significant ancillary technique in diagnosis or exclusion of HD.
- Although the statistical results of ChT IHC staining in diagnosis of HD is lower than that of CR, it still significant and play an important role when the results of CR is equivocal or misleading.
- A diagnostic panel using calretinin & choline transporter beside the ordinary corner stone H&E staining technique, offers easier, more accurate & confident diagnosis of HD.