Evaluation of epithelial proliferation in pediatric and adult cholesteatomas using the Ki-67 proliferation marker

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Introduction
Pathogenetic features of cholesteatoma are invasion and proliferation of epithelial cells.

Proliferation markers of keratinocytes like
- Cytokeratin
- Thrombomodulin
- Proliferating cell nuclear antigen

Poor prognostic factors that make cholesteatoma in children more aggressive than that in adults are not well understood.

Ki-67 is a widely used proliferation marker in tumors.

In this study, Ki-67 is used as a proliferation marker, to compare the proliferative potential of paediatric cholesteatoma with that of adult cholesteatoma.

Materials and Methods

Immunohistochemistry

Materials and Methods

Histology

Total of 200 cells: counted per specimen at magnification of ×400.

Ki-67 labelling index:
- Ki-67 positive cells / Total number of cells counted

Control and study groups: Labelling indices compared and statistically analysed using unpaired t test.

Observations and Results

No significant clinical or pathological differences between the adult and paediatric cholesteatoma patients or their complications.

Discussion

Hyperproliferative behaviour of cholesteatoma epithelium is well known.

Aggressive cholesteatoma: Greater extent of bone destruction and the greater tendency to recur.

In this study, there was higher proliferation index (14.6 per cent) in cholesteatoma epithelium as compared to 9.5 per cent in controls.

As per literature, pediatric cholesteatoma is more aggressive, more difficult to eradicate, has poor prognosis and twice as likely to recur than adult type. Histologically, there are more mononuclear elements in the perimatrix and more indirect markers of aggression (i.e. Matrix metalloproteinases 2 and 9 and cluster of differentiation 31 glycoprotein).

Here, we neither found any significant clinicopathological differences nor any significant difference in proliferation index between the Pediatric and Adult groups.

Conclusion

The clinical aggressiveness of cholesteatoma in children could not be attributed to increased proliferative activity of cholesteatoma epithelium.

Other factors like genetics and eustachian tube dysfunction might be contributing to the frequency and aggressiveness of paediatrics cholesteatoma.

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References:

Formalin-fixed specimens
Hematoxylin and eosin stained

Placement of 5μm sections on poly-L-lysine coated slides:

Stained with anti-Ki-67 secondary antibody using streptavidin-biotin method with 3,3’ diaminobenzidine as chromogen.