

## **A new way forward for treatment of tonsil cancer**

New Delhi, Nov 18 (India Science Wire): Oropharyngeal cancer or tonsil cancer as it is known in common parlance is increasingly becoming a matter of grave concern. In 2018, a total of 92,887 new cases and 51,005 deaths due to the disease were reported across the world. India has the highest incidence as well as the mortality rate for this cancer type, with 17,903 new cases and 14,953 deaths reported for 2018.

Several etiological factors are associated with the development of the cancer including consumption of tobacco (smoking and smokeless), areca nut, alcohol and Human Papilloma Virus (HPV).

In India specifically, the higher incidence rates of the cancer have been correlated to specific dietary and lifestyle habits such as chewing of areca or betel nut, and consumption and exposure to smokeless tobacco. Studies have also found it to be more prevalent among lower income groups. In particular, there is a high incidence of this cancer type in the northeastern states of India like Meghalaya, where the consumption of arecanut and tobacco is very high.

DNA Methylation is one of the ways in which genetic modifications happen, which leads to a change in the expression of genes. It occurs early and commonly in cancer. Further, there is a stable change of DNA, which can be monitored in a lab. It is easy to detect even in small amounts and is known to have potential in predicting survival differences and/or responses to therapy. The identification and characterization of differentially methylated genes and regions are used for the early detection of cancers leading to more effective diagnosis and better treatment outcomes.

A study on the whole genome methylation profile for tonsil cancer was recently undertaken on a subset of the northeast India population. There is a need to expand the scope for such studies.

A team of scientists from the Department of Biotechnology's National Institute of Biomedical Genomics (DBT-NIBMG), Kalyani, North-eastern Hill University (NEHU) and North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong have sought to fill the gap, though partially. They have jointly investigated the changes in the DNA methylation and expression of genes in tumours of patients suffering from Oropharyngeal cancer in Meghalaya. They, among other things, have found that as many as 241 genes were overexpressed and 194 were muted due to changes in the DNA methylation in the tumor tissue of these patients.

The findings of the study are expected to significantly improve upon the understanding of the disease and thus help in the development of better drugs, diagnostic methods. The study was conducted under a research grant funded by the Department of Biotechnology.

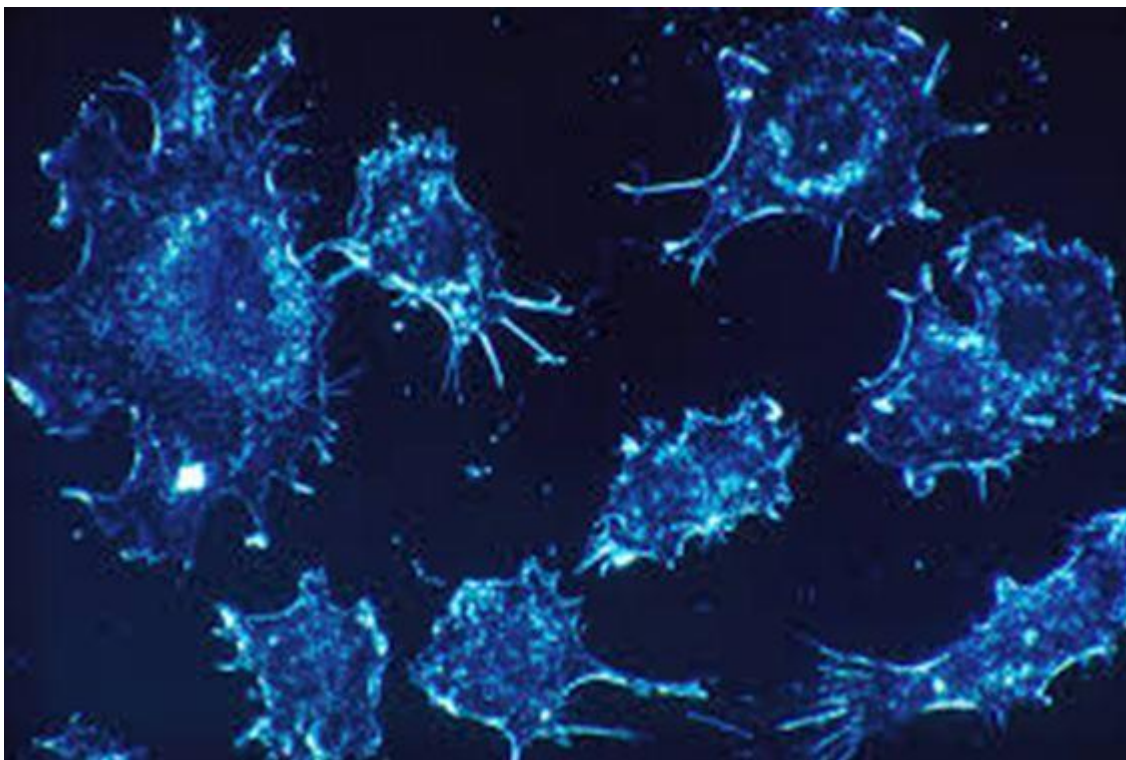
Speaking to India Science Wire, Dr.ArindamMaitra of NIBMG, a leader of the study team along with Dr.SrimoyeeGhosh of NEHU, said, "this was the first comprehensive study on genome whole genome DNA methylation and gene expression of this cancer type from this region, albeit on a limited number of patients. We plan to expand the study to a larger number of patients in other states of the north east region. We have identified key changes in the epigenome in these tumours which are predicted to have major roles in the development of this cancer. We would like to use this information for the development of biomarkers of oropharyngeal cancer which can be

implemented in the clinic for improved diagnosis and management of patients”.

Besides Dr Maitra and Dr.Ghosh, the team consisted of Dr.Neizekhotuo Brian Shunyu from NEIGRIMS and Lastborn Marathon, Sahana Ghosh, Arindam Palodhi, and Mohamed Imran. They have published a report of their work in *Frontiers of Genetics*. (India Science Wire)

keywords: arecanut, betel nut, tobacco, Meghalaya, DNA Methylation, genetic modifications, genes, diagnosis, genome, epigenome, biomarkers

ISW/USM/18/11/2020



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