SUMMARY
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➢ Cancers of the Upper Aero-digestive Tract (UADT), specially oral, pharyngeal and oesophageal is a leading cause of death for the world today.

➢ The disease is reported across the Globe to be mainly associated with tobacco and alcohol consumption.

➢ The problem of high incidence of UADT cancer is also a major health problem for the northeastern region of India and has been attributed to the habit of chewing betel quid and tobacco.

➢ As per the Indian data maintained by the National Cancer Registry Program (NCRP), the UADT cancers are very high in the entire northeastern region of India as compared to the national average.

➢ Out of all the UADT sites, cancer of the oesophagus and hypopharynx are seen more prevalent in northeastern region in comparison to the other parts of India.

➢ About 60% of the total cancer cases were reported to be the cancers of UADT during the study period (year 2000-02) which was almost double than other parts of the country (average of 35-40%).

➢ Out of all the UADT cancer cases, oesophagus represented 28% and pharyngeal region (Hypopharynx, Oropharynx and Pharynx etc.) represented 33%.

➢ Cancer of upper the aero-digestive tract is more or less a male dominating site for the northeastern region as in the other parts of the country and rest of the world.

➢ Out of the 7 northeastern states, maximum cases of UATD cancers reported from the of state Assam.

➢ District wise analysis showed that the Kamrup district of Assam reported with highest number of UADT cancer cases.
The age group distribution of UADT cancer cases in Assam was found to be nearly similar throughout the study period, peaking up in 4th decade of life, reaching peak in 6th decade of life and declined thereafter.

A positive correlation exists between the cancer of UADT and the habit of tobacco chewing, betel nut chewing and smoking. It was observed that about 94% of the total UADT cases included in the present study were having at least one of these habits.

People of the northeast region, unlike in other parts of the country, use to chew betel nuts and tobacco in different forms. The main among them are - [Betel nut + Betel Leaf + Lime] ; [Betel nut + Betel Leaf + Lime + Tobacco] ; [Tobacco with lime] etc.

Both the techniques PIXE & AAS used for elemental analysis in the present study showed almost similar results.

The findings of the present study made it firm that concentrations of certain elements vary to a significant level in the malignant UADT tissues compared to the normal.

It is also apparent that these differences pertain to specific types of cancer. This specificity shows that all the cancers cannot be grouped under one category; each type should be regarded separately. However, there are certain elements like Cu & Zn, concentrations of which are identical in many types of cancers.

Present study clearly demonstrated that the concentration of Zn was found very high in human malignant UADT tissue irrespective of age / sex / habit detected by both PIXE and AAS methods compared to the controls concurring with the findings with the other workers.

Elevated level of Cu concentration was measured in malignant UADT tissues by both PIXE and AAS methods confirming the similar reports by other workers.

Concentration of Se, Pb, Cr, V and Ti were also measured very high in all the malignant UADT tissue samples, confirming the possible toxic effects of these elements.
Very high concentrations of Zn, Cu, Se, Pb, Cr, V and Ti were also reported in the habituated materials—tobacco and betel quid.

As the 94% of the total UADT cancer cases included in the present study were habituated with betel quid chewing, tobacco chewing or both, it becomes apparent that presence of high concentrations of the above elements in the cancerous UADT tissue samples can be attributed to the habits of betel quid and tobacco chewing considering the presence of similar concentration of the elements in these habituated materials.

The present study presented the first ever clue that frequent and prolonged habits of chewing betel nut and tobacco possibly elevate the level of certain elements, directly or indirectly responsible for inducting carcinogenesis in the UADT of human.

This opens up a new area for further research to find out the aetiology of the disease and thus would be very helpful for presenting a strong evidence to the society about the lethal consequence of betel nut and tobacco consumption.