VI. SUMMARY AND CONCLUSION

Studies were carried out to assess the epidemiology of cervical cancer and antigenotoxic potential of green tea. The salient findings are summarized under the following headings:

6.1 Epidemiology of cervical cancer

A total of 200 cervical cancer patients were selected as study participants. Information regarding the socio-demographic characters, medical history, menstrual and reproductive history were obtained. Women between the age group 40-50 years had a significantly increased risk of cervical cancer (OR = 1.2; 95% CI = 0.5-2.6; p < 0.003). Women belonging to low income group (≤ 1000-5000 per month) showed increased risk of cervical cancer (OR = 10.5; 95% CI = 4.6-23.5; p < 0.0001). Women who have low level of education was associated with an increased risk of cervical cancer (OR = 3.69; 95% CI = 2.4-5.6; p < 0.0001).

Intake of oral contraceptives among the study subjects showed an increased risk of cervical cancer (OR = 2.46; 95% CI = 1.54-3.92; p < 0.0002). A positive association was noted between the HIV infection and risk of cervical cancer (OR = 5.1; 95% CI = 0.5-44; p < 0.001). The risk of cervical cancer was found to be increased with the less awareness on vaccination and pap smear screening.

Women who attained menarche below 13 years had a significantly increased risk of cervical cancer (OR = 2.49; 95% CI = 1.5-3.9; p < 0.0001). Irregularity of menstruation was significantly related to cervical cancer (OR = 10.8; 95% CI = 5.9-20.0; p < 0.0001). Having more abortion was associated with a significantly increased risk of cervical cancer (OR = 9.1; 95% CI = 1.4-10.2; p < 0.0001). Parity more than three was associated with significantly increased risk of cervical cancer (OR = 3.60; 95% CI = 2.43-5.34; p < 0.0001). Women who had menopause before 50 years was positively
associated with an increased risk of cervical cancer (OR = 6.8; 95% CI = 3.7-12.4; p < 0.0001).

In western Tamil Nadu of India, the above mentioned parameters are found to be main epidemiological factors for the occurrence of cervical cancer.

6.2 Antimutagenic activity of green tea

TA 98 strain

Supplementation of petroleum ether extracts of green tea to the daunomycin induced plates (SM) resulted in decrease in the revertant colonies. The number of histidine revertants in the plates supplemented with green tea was found to be $45 \pm 2.61; p = 0.01$.

The reduction in histidine revertant colonies were found to be $44 \pm 3.60$ by the addition of chloroform extract of green tea to the daunomycin induced plates ($61 \pm 2.1; p = 0.01$).

The number of revertant colonies was found to be decreased ($41 \pm 3.88$) in the plates supplemented with methanolic extract of green tea when compared to that of control plates ($61 \pm 2.1; p = 0.01$).

Addition of water extracts of green tea to daunomycin induced plates decreased the number of histidine revertants to $50 \pm 2.66$ as compared to that of the SM induced plates ($61 \pm 2.1; p = 0.01$).

TA 100 strain

The number of histidine revertant colonies were found to be $184 \pm 3.2$ in sodium azide induced plates and the addition of petroleum ether extract of green tea decreased the number of histidine revertants to $171 \pm 4.99; p. 0.01$.

The reduction in number of histidine revertant per plate were found to be $169 \pm 3.87$ when chloroform extract of green tea was added to SM induced plates ($p = 0.01$).
The reduction in number of histidine revertants per plate were found to be $167 \pm 3.37$ when methanolic extract of green tea was added to sodium azide induced plates ($184 \pm 3.2 ; p = 0.01$).

Addition of water extract of green tea was found to significantly reduce the colonies to $175 \pm 2.47 (p = 0.01)$

**TA 98 strain in the presence of S9 fraction**

Addition of petroleum ether extracts of green tea to daunomycin induced plates showed 12% inhibition in histidine revertant colonies in the presence of S9 ($p = 0.01$).

Addition to chloroform extracts of green tea to daunomycin induced plates showed tremendous reduction in the number of colonies to $141 \pm 8$ in the presence of S9 fraction ($p = 0.01$).

Methanolic extract of green tea showed 18% inhibition on histidine revertant colonies ($p = 0.01$).

When the water extracts of green tea was added to daunomycin induced plates ($155 \pm 4.9$), the colonies were reduced to $136 \pm 4.05$ in the presence of S9 fraction ($p = 0.01$).

**TA 100 strain in the presence of S9 fraction**

Supplementation of petroleum ether extract of green tea to sodium azide induced plates showed inhibition in number of colonies of *Salmonella typhimurium* TA 100. The colonies were reduced to $316 \pm 7.06$ in plates supplemented with green tea extracts.

The number of histidine revertant colonies in the sodium azide induced plates supplemented with chloroform extract of green tea was found to be $315 \pm 5.74$ when compared to SM ($359 \pm 5.5$).
The methanolic extract of green tea when added to sodium azide induced plates was found to decrease the revertant frequency to $311 \pm 6.45$ when compared to that of control plate ($359 \pm 5.5$).

Of the four extracts used in tester strain TA 100 in the presence of the S9, methanolic extract of green tea was found to be more effective.

The present study revealed the antimutagenic effect of green tea extracted using four solvents namely petroleum ether, chloroform, methanol and water. Off the four extracts used methanolic extract of green tea showed maximum antimutagenic activity in both tester strains TA 98 and TA 100.

Suggestions for further research

- Since the host genetic variability modifies the risk of cervical cancer in women infected with oncogenic Human Papilloma Virus (HPV), future investigation requires attention towards the role of genetic polymorphism on cervical cancer development.

- A complete elucidation of the molecular mechanism(s) involved with the anti-carcinogenic efficacy of green tea polyphenols may be useful in developing better chemopreventive strategies against cervical cancer.

Recommendations

- In a developing country like India, an inexpensive dietary chemopreventive intervention would be an attractive adjunct to existing cervical cancer prevention programmes. In this context, being easily affordable, green tea can be used as a cheaper beverage, possessing anticancer properties.

- India carries one fourth of world’s burden of cervical cancer. It is important that health authorities give high priority for cervical cancer screening and HPV detection in future cancer prevention health strategies.