PgmNr 2054

Tobacco smoking have no influence on buccal telomere length among Portuguese Master students

Miguel Brito[1], Patrícia Azevedo[2], André Coelho[1], Luísa Veiga[1], Ana Costa-Veiga[1,3]

author contact: miguel.brito@estesl.ipl.pt

1 - H&TRC, Health and Technology Research Center, Escola Superior de Tecnologia da Saúde de Lisboa, Instituto Politécnico de Lisboa
2 - Escola Superior de Tecnologia da Saúde de Lisboa, Instituto Politécnico de Lisboa
3 - NOVA National School of Public Health, Public Health Research Centre, Universidade NOVA de Lisboa

Background

In Portugal, the average age of starting tobacco consumption is around 16 years old, with an increase on consumption in recent years. The use of tobacco is a risk factor for age-related diseases, being one of the main causes of death and a risk factor for several chronic diseases, including diseases of the cardiovascular system, diabetes and cancer. Different studies have shown a clear relationship between tobacco smoking and oxidative stress, which is one of the factors that accelerate the shortening of telomers.

Objectives

The aim of this study was to evaluate the effect of tobacco smoking on the relative length of telomers in master students as a biomarker of health status.

Methods

A cross sectional study was performed by assessing relative Telomere Length (TL) in 133 master students. TL was evaluated from buccal swabs (Fig. 1) in 44 males and 89 females (aged between 18 and 52 years, mean 26.4) by multiplex quantitative Polymerase Chain Reaction (PCR) (Fig. 2). This technique consists in determining the relative ratio (T/S) between the telomere region copy number (T) and a single copy gene (S), albumin gene, using a relative standard curve. Mann-Whitney tests were used to detect TL differences between gender, smokers and non-smokers and addiction levels (Light vs Moderate or Heavy). Statistical analysis were adjusted for age, sex and BMI). Ethical approval for this study was obtained from ESTeSL Ethics Committee.

Fig 1. *Buccal swab collection with endobrush*

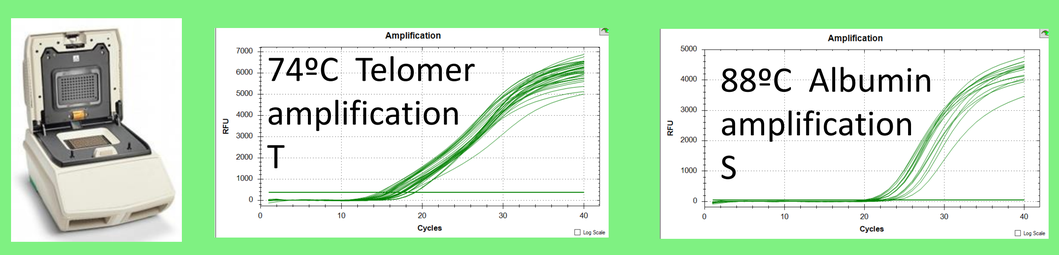

Fig 2. Multiplex quantitative Polymerase Chain Reaction

Results

Mean T/S value was 0.711 (SD 0.208) ranging from 0.091 to 1.539. No differences on average T/S value between males and females was observed.

Age and TL was negatively correlated (Fig. 3) as expected (*Spearman Rho*=-1.66, p=0.080). There were no statistically significant differences in TL between smokers and non-smokers and addiction levels (Mann-Whitney tests, p>0.10 ; Fig 4).

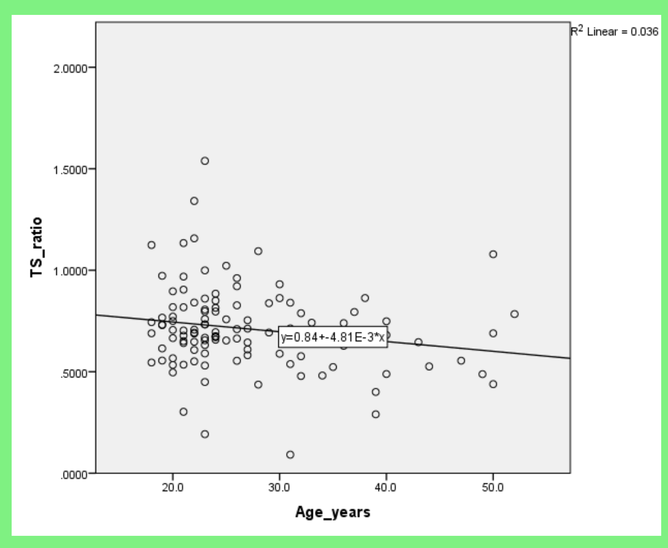

Fig 3. *Variation of TL with age*

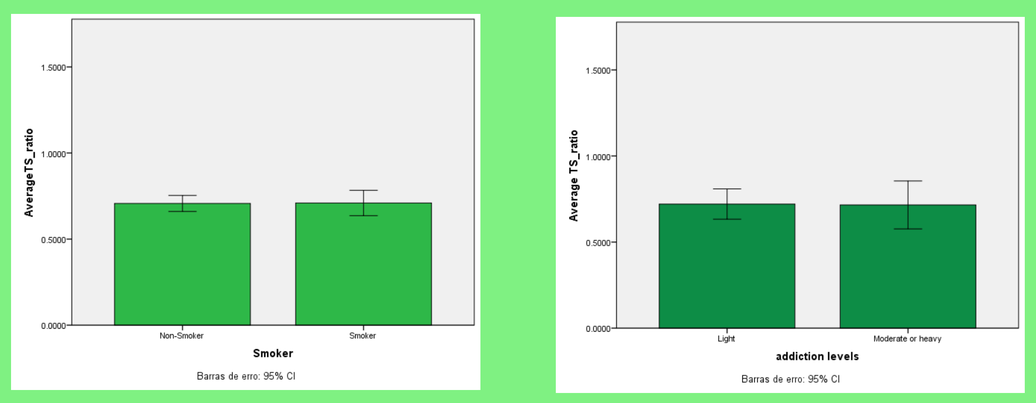

Fig 4. *The average T/S ratio* between smokers and non-smokers and addiction levels

Conclusions

A negative association between buccal TL and tabaco smoking was not confirmed. One possible explanation can be the high turnover rate in buccal exfoliate cells relative to other cells such as lymphocytes. Although the association has not been significant with TL, the negative effect of tobacco consumption on the risk of cancer risk and respiratory alterations is largely confirmed. Future studies should include a higher number of participants. Although buccal exfoliate cells is a less invasive method, TL can be more specific using lymphocytes cells.

Acknowledgements

We are grateful to the student community members who participated in this study. This project was supported by a grant from Instituto Politécnico de Lisboa, ref. IPL/2018/SCITelomer/ESTeSL.