Evaluation of telomere length in Brazilian pesticide exposed workers

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INTRODUCTION

Brazil is one of the largest consumers of pesticides in the world. This large consumption leads to a higher potential health risk to occupationally exposed workers. Thus, the present study was aim to evaluate the length of telomere as biomarker to occupational exposure to pesticides in rural workers living in the State of São Paulo, Brazil.

MATERIALS AND METHODS

The absolute telomere length (aTL) measurement was performed by quantitative real-time polymerase chain reaction (PCR) assay according to O' Callaghan and Fenech (2011).

RESULTS

The aTL was evaluated in 81 pesticide-exposed workers (69 males and 12 females) and in 81 non-exposed individuals (62 males and 15 females). The mean age of the pesticide exposed group was 47.87 ± 10.66 years, and the mean of working time was 30.00 ± 14.00 years, and mean age of the non-exposed group was 49,16 ± 10.06 years.
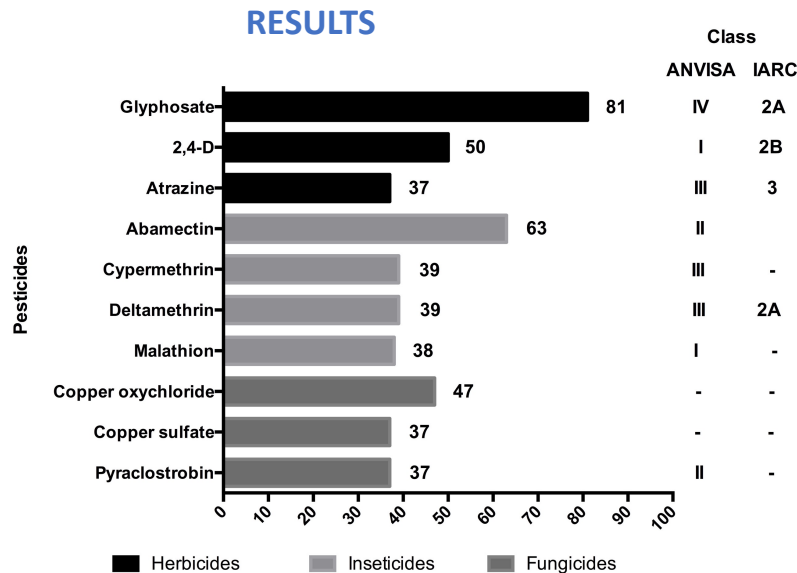

Figure 1. Pesticides more frequent used by rural workers in Barretos region, São Paulo. Classification according to their class, chemical group, toxicity and carcinogenicities. ANVISA - Brazilian Health Surveillance, IARC - International Agency for Research on Cancer
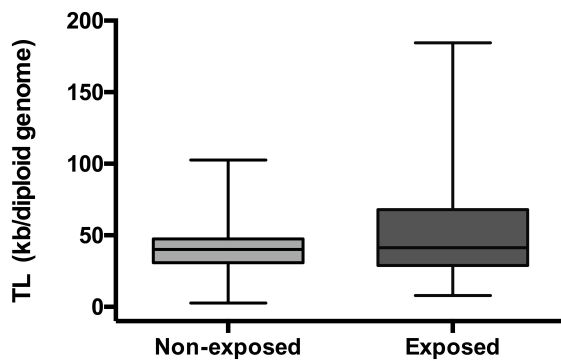

Figure 2. Telomere length (TL) evaluation for non-exposed (n=81) and exposed (n=81) groups. Data presented as minimum, lower quartile, median, upper quartile and maximum.

A multivariable linear regression model was performed to verify the influence of personal protective equipment use, ethnicity, gender, age, alcohol consumption, working time and no effect on aTL was found.
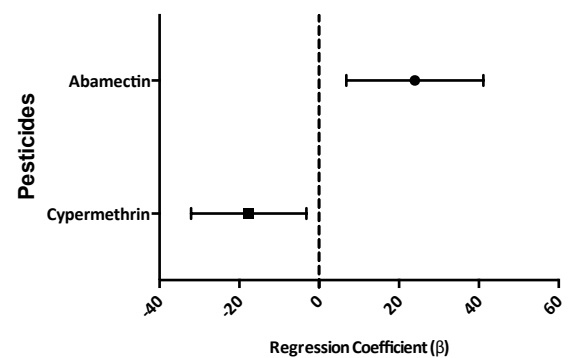

Figure 3. Forest Plot of multiple linear regression model to telomere length evaluated in regarding to more frequent pesticides used by farming workers.

CONCLUSIONS

Despite the comparison of exposed and non-exposed groups did not have differences in aTL, the results showed that pesticide exposure can be influence telomere length. Thus, our findings suggest a modulation in aTL by pesticides exposure.