Close

Web of Science
Page 1 (Records 1 -- 1)

Print

[1]

Record 1 of 1

Title: Genotoxicity of waterpipe smoke in buccal cells and peripheral blood leukocytes as determined by comet assay

Author(s): Al-Amrah, HJA (Al-Amrah, Hadba Jar-Allah); Aboznada, OA (Aboznada, Osama Abdullah); Alam, MZ (Alam, Mohammad Zubair); ElAssouli, MZM (ElAssouli, M-Zaki Mustafa); Mujallid, MI (Mujallid, Mohammad Ibrahim); ElAssouli, SM (ElAssouli, Sufian Mohamad)

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Abstract: Context: Waterpipe smoke causes DNA damage in peripheral blood leukocytes and in buccal cells of smokers. Objective: To determine the exposure effect of waterpipe smoke on buccal cells and peripheral blood leukocytes in regard to DNA damage using comet assay.
Materials and methods: The waterpipe smoke condensates were analyzed by gas chromatography-mass spectrometry (GC-MS). The study was performed on 20 waterpipe smokers. To perform comet assay on bucaal cells of smokers, 10 mu l of cell suspension was mixed with 85 mu l of pre-warmed 1% low melting agarose, applied to comet slide and electrophoresed. To analyze the effect of smoke condensate in vitro, 1 ml of peripheral blood was mixed with 10 mu l of smoke condensate and subjected for comet assay.
Results: The GC-MS analysis revealed the presence of 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4on, nicotine, hydroxymethyl furancarboxaldehyde and 3-ethoxy-4-hydroxybenzaldehyde in the smoke condensates. Waterpipe smoking caused DNA damage in vivo in buccal cells of smokers. The tail moment and tail length in buccal cells of smokers were 186 +/- 26 and 456 +/- 71, respectively, which are higher than control. The jurak and moassel smoke condensates were found to cause DNA damage in peripheral blood leukocytes. The moassel smoke condensate was more damaging.
Discussion: There is wide misconception that waterpipe smoking is not as harmful as cigarette smoking. This study demonstrated that waterpipe smoke induced DNA damage in exposed cells.
Conclusion: Waterpipe smokes cause DNA damage in buccal cells. The smoke condensate of both jurak and moassel caused comet formation suggesting DNA damage in peripheral blood leukocytes.

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Addresses: [Al-Amrah, Hadba Jar-Allah; Aboznada, Osama Abdullah; Mujallid, Mohammad Ibrahim; ElAssouli, Sufian Mohamad] King Abdulaziz Univ, Fac Sci, Dept Biol Sci, Jeddah, Saudi Arabia.
[Alam, Mohammad Zubair; ElAssouli, M-Zaki Mustafa; ElAssouli, Sufian Mohamad] King Abdulaziz Univ, King Fahd Med Res Ctr, Jeddah 21413, Saudi Arabia.

Reprint Address: ElAssouli, SM (reprint author), King Abdulaziz Univ, Fac Sci, Dept Biol Sci, Jeddah, Saudi Arabia.

E-mail Addresses: elassouli@yahoo.com

Author Identifiers:

Author	ResearcherID Number	ORCID Number
Faculty of, Sciences, KAU	E-7305-2017	
Alam, Mohammad	H-9480-2012	
Fac Sci, KAU, Biol Sci Dept	L-4228-2013	

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Web of Science
Page 1 (Records 1 -- 1)

Print

[1]