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Effect of smoking on visual evoked potential (VEP) and visual reaction time (VRT)

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Statement of the Problem: Nicotine in tobacco smoke causes demyelination. Again, hypoxia in long-term smokers is linked to neuropathy. Visual receptors are considered to be early sufferer of this neuropathy. Visual-Acuity and other ocular tests often fail to detect subtle changes of neuropathy which, however, can be detected by VEP test. Literature review shows that changes in Visual Evoked Potential (VEP) come earlier than PFT changes in smokers. Ironically, smokers claim that smoking improves their reaction time which can be assessed by VRT. Our study, therefore, was performed to relate smoking status with VEP as well as Visual Reaction Time (VRT). We also tried to correlate PFT variables with VEP and VRT, respectively.

Method: 56 subjects (smoker group=28 and non-smoker group=28) whose age and sex were matched, were included in the study (9th May-17th July 2016). Their PFT, pattern VEP of both eyes and VRT were recorded. The data were compared between the two groups using unpaired t-test, considering statistical significance at $p < 0.05$. Pearson's correlation was applied to correlate PFT variables with VEP and VRT, respectively.

Findings: The Forced Vital Capacity (FVC) (4.35 ± 0.83 vs. 5.32 ± 1.18 l, $p = 0.022$), FEF 25% (7.40 ± 2.38 vs. 8.74 ± 3.90 l/s, $p = 0.019$) and FEF 50% (6.11 ± 1.52 vs. 7.74 ± 2.57 , $p = 0.010$) were significantly lower in smokers compared to non-smokers. There was no significant difference in P100 wave latency of VEP between the groups. But, VRT of smokers were significantly shorter (431.69 ± 60.29 vs. 441.14 ± 123.54 ms, $p = 0.010$). Pearson's correlation did not reveal any correlation between PFT variables and VEP or VRT.

Conclusion & Significance: P100 wave latency, the VEP parameter, was shorter (better) in smokers but was not significant. Smokers have faster visual reaction time.

Biography

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