SUMMARY

Problem: A lot of attention is given to the safety of the driving and the possibility to register fatigue of the drivers. Driving cars is monotony and static. Vibration loading, which causes changes in the axial system. This causes discomfort and fatigue to drivers after some time of exposure to the loading.

Hypothesis: It is possible to prove the changes of mechanical characteristics (indicators) of the axial system using the TVS (transfer vibration through spine) method. By using TVS method before and after different types of loading or before and after relaxation it is possible to detect changes of the viscoelastic properties. This can be done by checking changes in the way of waves transfer through the axial system of the observed participants.

Objective: Verify the possibility of use of TVS method to register changes of the viscoelastic characteristics of the axial system.

Method: The TVS was chosen as a detection method. The method is based on the use of five-msec semi-bandwidth γ pulse stimuli and consequent application of continuously changing harmonic stimuli which periodically differ between 5Hz and 160Hz to the vertebrae C7 and L5. This wave is carried through the axial system and its acceleration on the spinous processes between C7 and S1 is scanned with the help of accelerometric sensors. According to the measured data (the input stimuli and its recorded responses measured on the spinous processes vertebrae) it is possible to identify changes of the viscoelastic properties of the human spine before and after applying vibration or another type of loading or relaxation.

Outcome and conclusions: The research results proved the fact that the TVS method is suitable for detection of the mechanical changes of axial system. It was also proved that changes caused by a monotonic or physical loads or relaxation influence the way of waves transfer through the axial system of the observed participants. Pregnant participants can also use this method.

Keywords: Vibrations, monotony load, axial system, mechanical characteristics, spine, vibrations transmission, pregnancy