

Title: Biomechanical reflection of the cervicocranial part during frontal impact

Objectives: The aim of the work was to analyze in which parameters differs ATD from human participant during frontal impact. Characterize the head movement, compare maximal post impact head speed between ATD and human volunteers and differences between volunteer with eye control and without.

Methods: Measuring was done with 8 volunteers and ATD (Manikin, 50th percentile man). For each volunteer were done two measurements, first without eye control and second with eye control. ATD was measured twice. It was recorded by Qualisys system, specifically by three optical cameras, on crash simulator. Results were processed in Qualisys Track Manager. There were tracked three markers, two on the body – forehead, shoulder and one on the sledge.

Results: Results showed that speed of the head depends on eye control. Volunteer without eye control had higher post impact speed of head (4,94 m/s) than ATD (3,67 m/s) and volunteer with eye contact (3,19 m/s). Quite the same result was observed in change of distance between head and sledge after impact. There was higher value for volunteer without eye contact than for ATD.

Keywords: Whiplash, frontal impact, Qualisys, crash simulator, cervicocranial part