

SUMMARY

Title

Biomechanics of whiplash injury and its influence on cervical spine structures

Objectives: Objective of the work is charting of studies examining mechanism and course whiplash event, its influence on osseous and arthral textures, intervertebral discus, ligaments, neural textures, cerebro-spinal fluid and vertebral artery. In summary form mention possibilities of prevention in terms of construction car.

Method: Diploma work is processed in the form of commented literary background research.

Results: Confrontation of individual works brought definite results, respecting kinematics cervical spine at rear impact. Most of in vivo and in vitro studies confirmed clear two-phase answer. Immediately after stroke (50 - 110 msec) cervical spine is forming S-form deformation with flexion UCS and extension LCS, whereas it is extension with abnormal IAR. Whole spine is loaded by compression at this time. The second period is C-form deformation with extension whole cervical spine. Risk of structures injury is the highest in S-stage. The most often it is localized in LCS, and it is in intervertebral joints including capsular ligaments, intervertebral discus and anterior longitudinale ligament. There are threatened also neural textures, both influence of tension force applied to UCS, and pressurized gradient CSF. Other risk areas in danger tension loading is vertebral artery and muscles by reflex developing contraction.

Influence of the elements passive safety on kinematics cervical spine after impact and relevance of the structures injury indicates tendency to decrease transmission coaming on cervical spine by limiting relative translation between torso and head.

Keywords: whiplash, mechanism injury, cervical spine, biomechanics