New Data on Whiplash Associated Disorders In Children –

Children are frequently injured in motor vehicle crashes (MVCs), yet there are few studies that support their need for treatment and the possibility that they could sustain ongoing impairment. Fortunately, Boyd et al. presented a paper in the 44th Annual Proceedings of the Association for the Advancement of Automotive Medicine concerning whiplash in children (1). The authors mentioned that this was the largest group of children to be clinically evaluated with whiplash associated disorder (WAD) to date. This paper should come as a welcome relief for all of those who over the years have expressed interest concerning the relative risk of injury for children in rear impact MVCs. Lövsund et al. conducted an outcome study that put the risk at 2/3 that of the adult population (2), but the data regarding pediatric risk is extremely limited. Young children are less frequently injured because they are more resistant to injury and because their heads usually are protected by the relatively high seat back. In fact, it has been reported that children up to ten years of age are at 1/6 the risk of injury from MVCs as adults (3). Several papers in this proceedings have looked at the problem of scaling injury tolerances for the pediatric population, but when it comes to occupant injury risk in specific crash conditions—such as low speed rear impact collisions (LOSRIC)—other variables may be more important than simple geometric or tissue modulus scaling. For example, kids more often ride in rear seats, which are generally safer than front seats. They tend to have smaller backsets (the distance between the front of the head restraint and back of the head in the normal seated position), which further reduces their risk of injury. Back seats in many cars still do not have shoulder harnesses, which would also decrease the injury risk. Children also have a greater cervical range of motion, less lifetime injury history, and no degenerative disease, which also contribute to injury risk and poor outcome.

This study focused on 4-16-year-olds presenting over a period of one year to ER departments in England. The goal was to compile data on incidence, severity, and clinical outcome. SRISD has previously discussed the potential bias of using convenience samples from ER departments as being due to the fact that only a small percentage of CAD patients are seen at ERs, which potentially compromises the studies external validity. However, probably 98% of the published outcome studies have used this study design! Another common problem is that many who present to the ER do so only out of fear that they may have serious injury. Some of these persons actually are not injured but are falsely enrolled in these studies. More rightfully, they are merely exposed to whiplash. Interestingly, the authors suggested the high incidence of CAD in this group might be due to a positive reporting bias of patients attending the ER—which is possible—but did not consider the other possible ramifications.

Telephone contact was made with legal guardians and a structured interview was arranged. If neck pain, discomfort or decreased motion were reported, an appointment for more formal review was made. This took place approximately five days after the crash. Children requiring resuscitation or in-patient admission were excluded. Of course, we know nothing of the patients who did not seek care at the hospital. With those graded as Grade I or higher, clinical review was also scheduled for 14 days, 28 days, and 56 days post injury. Overall 105 children were followed (39% were front seat passengers; 61% rear seat). Of these, 32% were involved in frontal crashes, 18% in side impacts, and 50% in rear impacts. It has previously been noted that, due to the significant differences in crash mechanics and resulting occupant kinematics, different collision vectors produce differing risks for acute injury (4,5), as well as treatment outcomes (6-8). We hate to see these mixed studies, but this is a common study
design. Only 61% were reported as being properly restrained by either three-point, four-point, or lap restraints.

The overall incidence of CAD was 47% (49/105), with 60% being symptomatic on the day of presentation to the ER. The remainder became symptomatic the next day. Again, most people become progressively less likely to present to an ER with longer lags in onset of symptoms, so it is likely that this sample was biased toward a more immediate onset. Slightly more children were female but the difference was not significant. Almost half (47% or 23/49) of those injured were over the age of 12 years and the age relationship was found to be significant. This age is also the age usually associated with puberty. The authors pointed out that the 12 year old and older group appeared to be affected similar to adults in terms of incidence of WAD when compared to younger children. Forty were graded as Grade I and the remainder as Grade 2. The average recovery period for the former was 6.4 days, and for the latter 19.7 days. The authors, as many have done before due to the confusing terminology used by them, misquoted the Quebec Task Force on Whiplash-Associated Disorders (9) as reporting a mean time to recovery of 28 days for CAD. In truth, the QTF defined recovery as a return to usual activities and did not even collect data on clinical recovery. Had the authors done a more thorough search of the literature, they would have read the 1998 article by Freeman et al. (10) that rebutted many of the QTF findings. In conclusion, even though the Boyd et al. article is to a certain extent methodologically flawed, overall, it does help us to further understand whiplash injuries in children.


