

Peer Review File

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Comment 1: Could the author clarify the capturing of ED injuries included in the NEISS database? The database was initially designed to capture injuries related to consumer products, how does this affect reporting of injuries that may not be associated with a consumer product?

Reply 1: This study reports specifically the incidence of lumbar fractures caused by consumer product injuries. In the introduction, we explain that there have been cases of lumbar fracture presenting to the ED caused by consumer products. Hence, the value of this national cross-sectional study is in the context of those captured injuries. In our discussion, we acknowledge that the study is limited by the data available through NEISS and may be under representative of the total injuries (including those not associated with consumer products). Nonetheless, analyzing the etiologies caused by consumer products is very valuable for future interventions, since these are the objects and mechanisms by which patients frequently interact with. To reflect this comment, we note in the discussion, “investigation should be viewed within the context of its limitations... may underestimate the true incidence of fractures... fractures presenting to the ED but not associated with a NEISS consumer product would not be captured”.

Comment 2: The incidence of lumbar fractures related to powered vehicles is only 3.7% - this appears surprisingly low?

Reply 2: We found that lumbar fractures caused by consumer products are predominantly in the older population. Older age of fracture patients biases the use and injury by powered vehicles (what is categorized as ATVs, powered bikes, etc). We define powered vehicles by codes shown in the table below. In addition, the 2019 NEISS Coding Manual does not report motor vehicles such as cars, distinct from powered vehicles, in its data which may lead to confusion. We hypothesize that older patients may not use powered vehicles as frequently or as harmfully compared to younger patients, leading to the value of 3.7%. To clarify this comment we note in the results, “The exclusive categories of injuries in Table 4 were developed in accordance with the NEISS Coding Manual, which excludes motor vehicles and physical human interactions as sources of injury”.

1062 - TRACTORS, OTHER OR NOT SPECIFIED, N.O.S.
1213 - GOLF CARTS, MOTORIZED VEHICLE
1290 - SNOWMOBILES (ACTIVITY, APPAREL OR EQUIPMENT)
1293 - AMUSEMENT ATTRACTIONS (INCLUDING RIDES)
1401 - POWER LAWN MOWERS, NOT SPECIFIED
1422 - RIDING POWER LAWN MOWERS
1744 - MOTORIZED VEHICLES, NEC (3 OR MORE WHEELS)

3215 - MOPEDS OR POWER-ASSISTED CYCLES
3259 - GO-CARTS
3285 - ALL TERRAIN VEHICLES (THREE WHEELS/OFF-ROAD ONLY)
3286 - ALL TERRAIN VEHICLES (FOUR WHEELS/OFF ROAD ONLY)
3287 - ALL TERRAIN VEHICLES (# OF WHEELS UNSPECIFIED/OFF ROAD)
3288 - DUNE BUGGIES/BEACH BUGGIES
3296 - ALL TERR. VEH. (MORE THAN 4 WHEELS; EXCLUSIVELY OFF-RD.
5033 - MOUNTAIN OR ALL-TERRAIN BICYCLES AND ACCESSORIES
5035 - MINIBIKES, POWERED
5036 - TWO-WHEELED, POWERED, OFF-ROAD VEHICLES
5042 - SCOOTERS / SKATEBOARDS, POWERED
5044 - UTILITY VEHICLES

Comment 3: The increasing incidence of lumbar fractures over the study period needs to be further explored - was this related to overall increase in reporting of injuries or changes to the database or are these changes in injury isolated to lumbar spine injuries.

Reply 3: The reporting of injuries has remained consistent as the NEISS database calculates national incidence from a set number of EDs and therefore reporting cannot be a factor that affects the increase of lumbar fracture incidence. In the introduction, we explain that spinal cord injuries in general have been increasing in incidence and is the initial reason for our inquiry. In the discussion, we write that “we found that increasing mean age was highly associated with an increase in annual number of lumbar vertebral fractures”. However, further analysis is needed to determine specific causality of the increasing incidence.

Comment 4: There is significant redundancy in the figures and tables presented. For example, Figure 1 and Table 3 show the same information regarding mean age of injuries. Table 4 and Figure 2-4 also largely represent similar information. These should be consolidated

Reply 4: This comment from the reviewer is greatly appreciated and we have removed table 3 as well as figures 3 and 4 in efforts to consolidate our presented data.

Comment 5: Perhaps the authors could also discuss the influence of the rising numbers of lumbar fractures to the treating hospitals. Elderly patients are most affected from minor impact fractures, that can be treated conservatively in most cases.

Reply 5: In our discussion, we describe how the increasing incidence and age of patients are “highly associated.” We hypothesize that this may be related to the aging population of the U.S. Older age may thus predispose patients to fracture. Future studies should address interventions based on age to improve lumbar fracture care. Unfortunately, the NEISS database does not disclose the severity of the lumbar fractures or the treatment that the noted individuals

underwent; therefore we decided not to touch on the topic of treatment of such injuries. We added this note in the discussion “categorizing these injuries as being operable, inoperable, or treatable with conservative measures will better inform physicians of the economic impacts of increased lumbar fractures... categorization could provide improved prevention, diagnosis and treatment of older patients, who are most affected in lumbar fracture cases”.

Comment 6: Do you think that the rise of the incidence of lumbar fractures would also lead to a rise of operative procedures for these fractures?

Reply 6: It is possible, but NEISS does not have data on operative procedures. Any analysis of the events after patients reporting to the ED is beyond the scope of the study. In the discussion we do note, “the rising incidence of lumbar fractures may underlay the noted rise of operative procedures in spinal care.”