Background and objective: Results:

No man is an island: living in a more disadvantaged neighborhood increases the likelihood of developing persistent moderate or severe neck pain 6 weeks after motor vehicle collision.

Methods:

Study population: European Americans ≥18 years old presenting to one of eight emergency departments (EDs) in four no-fault insurance states within 24 hours of MVC who did not have injuries requiring hospital admission enrolled.

Assessments: Baseline ED assessment included collection of participant home address and an evaluation of current neck pain intensity (0-10 NRS) and neck pain intensity during the past week (0-10 NRS). Pain scores ≥4 were defined as moderate/severe neck pain (MSNP) if the pain was attributed to MVC by participant. Participant addresses were geocoded and matched with census data. Socioeconomic placement (SEP), a well-validated aggregate measure of nSES, was calculated using ACS data and split into quartiles representing most disadvantaged (1st Q), moderately disadvantaged (2nd Q and 3rd Q), and not/least disadvantaged (4th Q).

Analyses: Binary logistic regression (SAS 9.3) was used to assess the effect of the nSES on moderate to severe neck pain at six weeks, while a mixed model was used to assess the effect of nSES on neck pain (0-10 NRS) in the ED, at six weeks, and at six months. Both models controlled for individual level factors (prior pain, age, sex, education, income, and full time employment) while only mixed models estimated random effects of clustering between counties.

Results:

• 948 participants enrolled in the ED, 859/948 (91%) and 935/948 (99%) were geocoded (Figure 1). The cohort was relatively wealthy ($64,015 v. $52,762 median household income) and educated compared to US means (87.4% v 85.4% high school graduates) (Table).

• nSES predicted MSNP attributed to MVC six weeks after MVC and results were similar, but attenuated at six months, while there was no association detected between nSES and neck pain in the Figure 2).

• In a mixed model controlling for neighborhood clustering, mean neck pain scores were not significantly higher in the ED (F=0.69, p=0.50), but were significantly higher in the most disadvantaged quartile (1st Q) and moderately disadvantaged quartile (2nd Q and 3rd Q) than the not/least disadvantaged quartiles (3rd & 4th Q) at six weeks (F=6.53, p=0.0016) and at six months (F=3.10, p=0.046) (Figure 3).

Table 1. Census tract cohort representation in A Michigan B New York C Massachusetts D Florida

<table>
<thead>
<tr>
<th>Cohort Characteristics</th>
<th>Overall Pain in the ED</th>
<th>Most severe (≥7 NRS)</th>
<th>Moderate (4.0 to 6.5)</th>
<th>Severe (7.0 to 10.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort</td>
<td>Overall</td>
<td>Most severe</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Percent below US poverty line</td>
<td>7.9 (8.3)</td>
<td>7.5 (8.3)</td>
<td>13.3 (19.3)</td>
<td>13.3 (15.3)</td>
</tr>
<tr>
<td>Median household income</td>
<td>$57,516 (25,560)</td>
<td>$64,015 (25,560)</td>
<td>$56,400 (25,560)</td>
<td>$52,762 (25,560)</td>
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</tbody>
</table>

Persistent neck pain rates in individuals experiencing MVC are higher in more disadvantaged neighborhoods, areas which are likely high stress environments. These results add further evidence supporting the biopsychosocial model of pain. Further studies are needed to determine the exact mechanism of living in a disadvantaged neighborhood on pain persistence after trauma.

Figure 2. RR of MVC-related neck pain by nSES

Figure 3. LS-mean neck pain over time by nSES

Conclusion:

References:


5. Bortsov AV1,2, Soward A1,2, Swor R3, Peak D4, Jones J5, Rathlev N6, Lee D7, Domeier R8, Hendry P9, McLean SA1,2,10


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