Concussion at presentation to primary care vs. specialist: Possible implications for management (Poster)

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Concussion at Presentation to Primary Pediatric Care vs. Specialists: Possible Implications for Management

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Introduction

The published estimates of the annual number of pedestrian concussions in the United States vary by definition.1-3 When considering all children under 18 years of age with sports and recreational concussions, including those not seen in a health care setting, the estimate is as high as 1.1 to 1.9 million annual occurrences.4 In a study of emergency room (ER) patients under 17 years old between 2001 and 2006, the estimate was 144,000 annual visits for pediatric concussions.5 During the interval between 2001 and 2009, the CDC reported an average of 122,112 annual ER visits for patients diagnosed with concussions between the ages of 10-19. Clearly, not all pediatric concussions are seen in ERs. For example, Arbogast reported that 81.9% of concussed patients under 17 years old were not treated by specialists.6 This study describes the primary care pediatric physicians (PCPP). As such, it is likely that in many locations, PCPPs see the majority of patients who seek care outside the emergency rooms.7-11

A number of observational studies examining the benefit of cognitive rest (CR) have been conducted. However, these studies are subject to confounding and are not the only indication, such that patients with different levels of symptoms receive different treatments and recover at different rates.12-14 This study cannot consistently identify whether the differences in response are due to differences in the therapeutic approach, initial differences in the patients, or patients’ ability to recover without therapy. This is complicated by the wide variability seen in concussion strategies, symptoms and outcomes.12-14 As a result, recent guidelines and reviews provide guidance based on incomplete data and may not be applicable to the general population of concussed patients.15,16

Given the lack of randomized controlled trials (RCTs) evaluating management approaches to concussion, guidelines for management are based on clinical experience, of which the majority have been written primarily by specialists treating the concussion patient, either in the ER or to the PCPP for ongoing care12-18. Therefore, an assessment of the relevance of these guidelines to the patient population seen initially by the PCPP should take into consideration any differences between the populations seen and followed by specialists versus those seen and followed primarily by the PCPPs, many of whom are not referred for specialty care. To explore the differences between the population of concussed pediatric patients cared for in primary care and those seen in a specialty clinic, we collected data on the characteristics of patients seen at a sports medicine clinic and a pediatric concussion clinic in a tertiary medical center and compared these data collected data in a PCPP serving an overlapping catchment area.

Methods

Patients presenting with a concussion to the PCPP of one of the authors (BT) located in Cherry Hill, NJ, were enrolled prospectively from 12/2011 to 4/2013. Data collected were the basis for two previously published observational studies.23,24 For comparison, two specialty clinics involved with concussion care in the Cooper University Health System, Camden, NJ agreed to participate in this study: 1) the Sports Medicine Clinic, designed to care for sports-related concussions, and 2) the Pediatric Concussion Clinic, designed to see patients with concussions sustained from non-sports activities or non-sports-related sports. These specialty clinics had patients from seven locations in southern New Jersey, including Cherry Hill and a similar catchment to the PCPP. All the clinic offices used the same electronic medical record system. The medical records for all patients seen in these two clinics with an ICD9 billing code for concussion between August 2013 and May 2015. In the PCPP and both clinics, patients were included if 11–19 years old, not in college, and sustained injuries which resulted in concussion scores defined as the 4th International Consensus Statement on Concussion.25 Patients were excluded if they were hospitalized overnight or had abnormalities on CNS imaging. Patients were considered at rest if they were not participating in sports and had not returned to school including weekends prior to being seen. Immediate CR was defined as having at least 24 hours of CR immediately following the injury. Anxiety level, age, and gender were collected along with time from injury to visit, and period of either immediate or subsequent CR. This study was approved by the Institutional Review Board of Cooper University Health System.

Results

Table 1: Patient and Concussion Incident Demographic - primary care versus combined specialty clinic

| Age (in years) | PCPP | Combined Specialty Clinic
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8-11</td>
<td>132</td>
<td>24</td>
</tr>
<tr>
<td>12-13</td>
<td>67</td>
<td>23</td>
</tr>
<tr>
<td>14-15</td>
<td>141</td>
<td>23</td>
</tr>
<tr>
<td>16-17</td>
<td>104</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 2: Referral Source, by clinic

| Referral Source | PCPP | Combined Specialty Clinic
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In Clinic</td>
<td>104</td>
<td>23</td>
</tr>
<tr>
<td>EMS</td>
<td>200</td>
<td>23</td>
</tr>
<tr>
<td>Police</td>
<td>104</td>
<td>23</td>
</tr>
<tr>
<td>Mechanic</td>
<td>141</td>
<td>23</td>
</tr>
<tr>
<td>Parent</td>
<td>214</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 3: Days from Injury to Presentation at Primary Care versus Specialty Clinic stratified by Cognitive Rest Status

| Cognitive Rest Status | PCPP | Combined Specialty Clinic
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Cognitive Rest</td>
<td>104</td>
<td>23</td>
</tr>
<tr>
<td>No Cognitive Rest</td>
<td>104</td>
<td>23</td>
</tr>
</tbody>
</table>

Discussion

• Patients presenting to a PCPP are seen sooner after their injury compared to specialists
• Specialists typically see patients referred to ER or PCPP, likely because of persistent symptoms
• More PCPP patients vs. specialty clinics had immediate cognitive rest after injury (61.4% vs. 27.9% in the specialty clinic

There are limited RCTs studying the relationship between CR and return to school performance to grade management

• Other recommendations and guidelines believed it is best for patients to remain sedentary or rest until symptoms resolve, however, this has recently changed to state patients may return to school on an accommodation basis (18-20,25,27,31)

If these recent guidelines were made by specialists and this study proves that specialists see different patients than PCPPs, then these new guidelines still apply to patients seen by PCPPs

• The average patient seen by the PCPP recovers at 11 days (23-24), and this study found that the average patient doesn’t use a specialist until 10 days post injury

Limitations

• The way we defined “rest” and “immediate cognitive rest” was by missing school was often uncertain from retrospective chart review in the specialty clinic patients
• PCPP patient data was collected prospectively, while specialty clinic patients were enrolled retrospectively. Therefore, this data doesn’t necessarily apply to different time periods
• It is possible that the patient populations in this study do not represent those of the general population

Conclusions

• Specialists and PCPPs are different types of pediatric concussion patients who present at different time periods after their initial injury
• Perhaps the guidelines written by specialists do not apply to the patients primarily managed by their PCPP
• More RCTs are needed to properly identify the differences between these two patient populations, and how to best return these managed by PCPPs to academics and athletes

References