How Tough is the Tough Mudder? Comparing Differences in Injury Incidence Rates at Obstacle Races Versus Marathon Races: A Systematic Review

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Background

Obstacle course racing is an emerging trend in competitive foot races. Some of these events are named Tough Mudder, Spartan Race and Warrior Dash. From 2010 to 2013, it is estimated that more than 3 million people have competed in these challenge races which is more than twice the number of people finishing traditional marathons during the same period of time. Obstacle course racing requires the ability to run for long distances combined with physical challenges to core strength, agility, balance and coordination. Obstacles include activities such as climbing, swimming, rafting, jumping, swinging and crawling through many different types of terrains and conditions. With the increased challenges comes a theorized increased both chance and severity of injury.

Purpose

To compare the incidence of injuries sustained at obstacle course races to traditional marathon races.

Methods

A systematic review of recent literature was completed to identify evidence related to the clinical question. The search was completed by utilizing EBSCOhost. A PRISMA strategy utilizing key words identified 36 articles. After applying screening criteria 6 articles were included for data extraction and analysis. Two reviewers assessed quality of evidence using the checklist developed by Downs & Black. A neutral third reviewer was utilized to resolve disagreements leading to a consensus quality rating of good, fair, and poor.

Summary of Findings

<table>
<thead>
<tr>
<th>Lead Author and Year</th>
<th>Type of Race</th>
<th>Rate of Injury</th>
<th>Most Common Reported Injuries</th>
<th>Rate of Hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Age 2009</td>
<td>Obstacle (Tough Guy)</td>
<td>1.25% = (251/20000)</td>
<td>1. Hypertension 24%</td>
<td>14/20000 = 0.070%</td>
</tr>
<tr>
<td>Greenberg 2014</td>
<td>Obstacle (Tough Mudder)</td>
<td>Not Reported</td>
<td>Not Reported</td>
<td>38/22000 = 0.173%</td>
</tr>
<tr>
<td>Lund 2015</td>
<td>Obstacle (Warrior Dash and Tough Mudder)</td>
<td>34.04/1000</td>
<td>1. MS (acute)</td>
<td>40/45325 = 0.098%</td>
</tr>
<tr>
<td>Pearson 2018</td>
<td>Obstacle (Wolf Run 7x events)</td>
<td>421/43000 = 0.956%</td>
<td>1. Exercise associated collapse (5%)</td>
<td>48/45000 = 0.112%</td>
</tr>
<tr>
<td>Roberts 2000</td>
<td>Marathon (26.2 miles)</td>
<td>1459/60757 = 2.40%</td>
<td>1. Soft tissue injuries (21%)</td>
<td>30/60757 = 0.049%</td>
</tr>
<tr>
<td>Tang 2008</td>
<td>Marathon (26.2 miles)</td>
<td>1144/3700 = 3.39%</td>
<td>1. Dehydration (32%)</td>
<td>16/37500 = 0.047%</td>
</tr>
</tbody>
</table>

Quality of articles were determined to be 1 good, 3 fair, and 2 poor. 202,733 subjects were included from traditional marathon and obstacle type races. Reported marathon injury incidence rates ranged from 0.024 – 0.034 compared to 0.010 – 0.032 for obstacle style races. The calculated rate of injury from extracted data was 2.6% for marathon participants and 2.0% for obstacle course participants. When considering severity of injuries as defined by emergency hospitalizations, the marathon rate was 0.05% and obstacle rate was 0.11%. The most common injuries at marathon races were exertion related, while at obstacle course races the most common injuries were exposure related and musculoskeletal injuries.

Clinical Relevance

In a short amount of time, obstacle course racing has emerged from a novelty to a mainstream athletic competition. Very little is known about the impact that training and competition in such races has on the individual athlete. This report gains some first insight that while the obstacle course athletes may not be injured at a significantly greater rate than marathoners, it appears when injuries do happen they may be more severe as defined by rate of hospitalization.

Conclusion

Extracted data revealed that reported marathon racer injuries rates were slightly higher when compared to obstacle course racers; however the severity of injuries sustained as defined by need for hospitalization is greater for obstacle course races. Reporting varied for each type of racing event which makes exact comparisons challenging. As obstacle course races grow in popularity, more research needs to be completed in order to fully appreciate the associated risk of participation.

References

2. Dwivedi, SH, Blago N. The Possibility of Creating a Checklist for the Assessment of the Risk and Their Qualitative/Quantitative Ratio of Obstacles and Non-Standardized Sites of Care Injuries: Journal of Epidemiology & Community Health 2010;64:151–156.

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