

BRIEF REPORT

Ice Climbing Festival in Sochi 2014 Winter Olympics: Medical Management and Injury Analysis

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Objective.—Sports ice climbing (SIC) is developing rapidly as an independent sport with Olympic potentials. To date there has been no prior systematic evaluation of injury risks and injury patterns in a SIC-specific setting.

Methods.—This paper reports injury statistics collected during the Ice Climbing Festival, which was held during the XXII Winter Olympics in Sochi, Russia. More than 2500 amateur climbers and 53 professional athletes climbed during 16 days on a dry tooling lead-difficulty, and a 17-m vertical ice wall (grade M4/M5 or Union Internationale des Associations d'Alpinisme [UIAA] V+/VI-).

Results.—The injury incidence rates were 0.82/100 in lead-difficulty and 0.83/100 in speed ice climbing with an overall incidence rate of 0.83/100. The injury risk in amateur climbers was 248 injuries per 1000 hours of sports activities. There were no major accidents or fatalities during the event. SIC could be graded I according to UIAA Fatality Risk Classification. Penetrating and superficial soft tissue injuries (cuts and bruises) were the most common. The anteromedial aspects of the thigh and knee were the most typical injury locations.

Conclusions.—The findings from this study provide an opportunity to compare injury patterns in SIC with what has previously been reported for traditional ice climbing. SIC has lower fatality risks, higher minor injury rates, and comparable injury severity to traditional ice climbing. The main limitation of our findings is that they were obtained on a population of amateur ice climbers with no previous experience. Further research should be performed to define injury risks in professional competitive ice climbers, and standard methodologies for reporting injuries should be considered.

Key words: ice climbing, injury, sports medicine, UIAA

Introduction

Ice climbing is an extreme sport that was historically part of traditional mountaineering and consisted in ascending natural walls such as ice-covered cliffs or frozen waterfalls (traditional ice climbing). Schöffl et al¹ distinguishes 2 subdisciplines of traditional ice climbing—alpine ice and water ice climbing. Sports ice climbing (SIC), which consists of 2 disciplines—lead and speed—could be defined as ice climbing activities and competitions, which are held according to Union International Association de Alpinism (UIAA) rules in a specific

setting: artificial vertical ice wall or overhanging dry tooling section. SIC has been developing rapidly since the mid-20th century. The first International World Cup (IWC) was held in 2000 in Cortina, Italy. The IWC generally consists of 4 to 6 separate competitions held during a 3- or 4-month competition season, with each event hosting at least 100 competitors. The ice climbing competition world has recently expanded with youth competitions in 2013, and para-ice climbing events in 2014. SIC was showcased during the XXII Winter Olympics in Sochi, Russia, and is being considered for a full Olympic medal sport event.

The number of papers about the medical aspect of ice climbing remains low. All previous studies were focused on traditional ice climbing (or associated outdoor

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activities). An essay by Patterson² gives a general description of injuries in ice climbing, and Schindera et al³ describe injuries from glacial sports including ice climbing, but that reflects only patients who were involved in glacial-crevasse or ice-field falls. There are only 2 original studies specific to medical considerations for ice climbing: Mosimann⁴ and Schöffl et al¹, and other 2 other papers by Schöffl et al^{5,6} summarized and reviewed these data.

Mosimann⁴ describes injury patterns in traditional ice climbing and did not include any activities in a sport-specific setting. A retrospective questionnaire study on 88 climbers by Schöffl et al¹ gives a comprehensive analysis of risks and injury patterns in traditional ice climbing but is also not specific to SIC. Review papers by Schöffl et al^{5,6} compare the epidemiology of injuries in mountaineering and rock and ice climbing; however, they summarize data from previous studies that were conducted in traditional ice climbing. Taken together, these studies showed small injury rates, minor injury severity, and few fatalities.⁵

To our knowledge there has been no prior systematic evaluation of injury risks and injury patterns in an SIC-specific setting. Another limitation of previous studies is that data were often not reported in a standardized manner.

SOCHI 2014 ICE CLIMBING FESTIVAL OVERVIEW

The Ice Climbing Festival was held in the Olympic Park during the XXII Winter Olympics in Sochi, Russia, as a part of the cultural program in 2014. More than 2000 people came to visit the ice climbing venue (Figures 1 and 2) of the festival every day to explore the different aspects of mountaineering such as rope work, dry tooling, and climbing actual ice on a manmade structure.

The ice climbing construction had 2 independent structures: an overhanging dry tooling lead-difficulty and a 3-sided 17-m vertical ice wall (grade M4/M5 or UIAA V+/VI-), used for speed climbing in competition but also used for amateurs. Most of the amateurs climbed

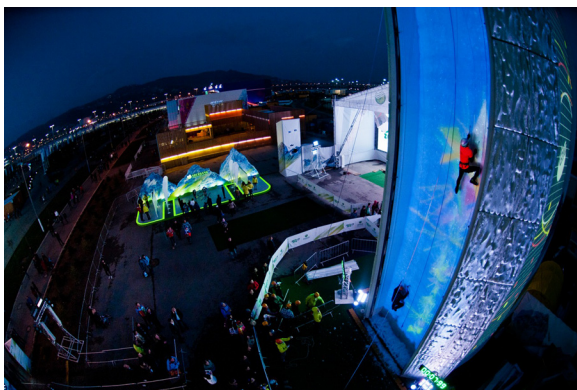


Figure 1. Venue of the event. Speed ice climbing wall at night.



Figure 2. Venue of the event. Lead climbing wall.

on the latter, and the dry tooling section was only used as an alternative if the ice wall was closed as a result of weather conditions. Top rope belay in both disciplines was used. Amateurs who ice climbed during the festival had little, if any, previous experience in traditional ice climbing or SIC. All amateur ice climbers were given safety instructions and signed a consent form with a description of possible hazards. If a person climbed several times a day, he or she signed a new consent form each time. Visitors with obvious signs of alcohol or other types of intoxication were not allowed to climb. Amateurs were provided with helmets, boots with crampons, and technical ice axes (The Light Machine; Grivel, Aosta, Italy; or ProMasteR; Ice Rock, Kirov, Russia), but not the speed climbing tools (also known as ice fifis), which are sharper and shorter than standard ice climbing tools. Climbing instructors gave visitors a short instruction about the general aspects of ice climbing techniques.

A total of 53 world professional competition ice climbers from 16 countries who take part in IWC competitions on a regular basis came to participate in the event, representing Switzerland, the United States, Canada, France, Sweden, Mongolia, Azerbaijan, Germany, Japan, the Netherlands, Great Britain, Portugal, Iran, Ukraine, South Korea, and Russia. These professional competitors showed and shared their skills with the general public and introduced ice climbing to Olympic spectators.

Methods

The Ice Climbing Festival had independent medical coverage of 2 medical doctors working alternate 24-hour shifts. Because the event was a part of a cultural program during the Olympics, medical help for both amateur and professional climbers was provided by UIAA-hired physicians on scene in a designated medical zone. In 2 cases, a hand and a face injury that needed

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