

The snow, the men, the shovel, the risk? ER admissions after snow shovelling: 13 winters in Bern

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For some people, winter snow shovelling is an unloved but necessary duty, especially in a country with high mountainous areas such as Switzerland. Not only environmental forces but also problems from physical exertion cause many admissions to emergency departments.

In 2011, Watson et al described a representative sample of snow-shovelling emergencies in the USA [1]. They found an average annual rate of snow shovel-related emergencies of 4.15 per 100,000 in the American population. The cardiac effect of snow shovelling has also been described in other studies [2]. There are many case descriptions of snow shovelling-related myocardial infarctions [3, 4].

In 2012, Nichols et al demonstrated that a family history of premature cardiovascular disease and male gender were strong independent risk factors for suffering a snow shovelling-related acute cardiac event [5].

We speculated that shovelling appears to be some sort of physical exercise model to test coronary heart disease and, therefore, retrospectively analysed patient events throughout a 13-year period.

In our database, patient data were analysed from 2001 to 2013. Medical records were screened for snow-shovelling incidents. Overall, approximately 350,000 cases were screened via a computer database.

A total of 21 patients had documented snow shovelling-associated admissions. One patient was excluded, as the reason for admission was not related to snow shovelling. Our patients had a mean age of 62 ± 15 years. Fifteen subjects were male and five female. The leading causes of admission were: in 5 patients acute coronary events, in 11 patients orthopaedic ailments, in 2 patients neurological reasons and in 2 patients abdominal pain. None of the admitted patients died. Seven patients were managed in the outpatient setting; the rest required hospital admission. Three of our patients required surgery. Both neurological events were linked to intracranial haemorrhage and required surgical treatment. In all, 85% of outpatient cases (6/7) were admitted for orthopaedic problems.

In contrast, all of the patients suffering cardiac events (23.8%; 5/21) required hospital treatment. It has been reported that low air temperature is associated with vasoconstriction and increased heart rate and blood pressure, as well as increased blood viscosity, fibrinogen and platelet

counts [6–8]. Just recently in the USA, three deaths due to cardiac failure during snow shovelling were reported [9]. The combination of physical overstrain and inhalation of cold air may lead to cutaneous vasoconstriction and consequently to higher cardiac afterload; this could contribute to the reported cardiac events. These were the most serious events recorded in the rate of hospital admissions. Our results are consistent with samples in the USA reported by Watson et al. [1]. In contrast to the latter population, there was fortunately no in-hospital death in our database. In both studies, about 80% of cardiac events were associated with male sex [1]. In our study only one of the cardiac events showed an ST-segment elevation myocardial infarction; three were non-ST-segment elevation myocardial infarctions and one event was a cardiac syncope.

The average annual rate of snow shovel-related emergencies was 4.15 per 100,000 in the American population in 1990–2006. In contrast, there were only 20 cases in 13 years (2001–2013) in our sample (ca. 0.004%) [1]. Moreover, only two of our documented cases occurred in the first 7 years of surveillance. Unfortunately no database exists for the whole of Switzerland and there is, therefore, no exact annual rate. As a limitation, we cannot exclude the possibility that some cases were missed, as data were analysed retrospectively and were based on the documentation of the respective physicians describing the aforementioned events in association with snow shovelling in the patients' files.

From our data, we firstly conclude that snow shovelling is quite unsuitable as a model for testing coronary heart disease in Switzerland. Secondly, the public service shovelling snow in Switzerland apparently protects people from the risk associated with this form of physical exercise, as compared with the USA. And finally, snow shovelling appears to be a form of exercise predominantly or more dangerously performed by men.

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