How do you take off the sweater? Gender differences and risk for shoulder dislocation

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Abstract:

Objectives – To evaluate the preferred movement to take off sweaters or T-shirts and the differences between men and women

Design – Comparative study

Participants - Seventeen males and twenty two females from our labs, friends, relatives as well as some participants in an on-line poll

Main outcome measures – The gender preferred way to take off a sweater

Results – 86.4 % of women cross the arms to take off the sweater while only a 5.9% of men use this approach. By contrast, grabbing the sweater is the selected way for men (76.5 %) while any woman (0%) chooses this option.

Conclusions – The marked gender differences in the way to take off the sweater must be taken into consideration when interpreting the higher incidence of shoulder injuries shown by men
Introduction

Shoulder dislocation is a commonly seen in accident and emergency and trauma clinics and occurs when the head of the humerus pops out of the glenoid socket [1]. It is a consequence of a strong force pulling the shoulder upward or outward, or from an extreme external rotation of the humerus. In general, management includes prompt reduction and sling immobilization, but in some cases, as in athletic patients, surgical intervention may be warranted because of the risk of recurrent instability.

The most common cause is trauma, followed by muscle contractions due to seizures of different causes (epileptic, hypoglycemia, toxic, or hypoxic). This lesion has a bimodal distribution, and it clearly affects mainly men (70%) with a mean age of 33.5 years, whereas in women, the average age is 57 years. The gender differences [2] are commonly explained by differences in lifestyle.

In this paper we hypothesized that some apparently irrelevant factors could play a determinant role in the gender differences reported for shoulder dislocation. In particular, the remarkable differences between men and women on how to take off a sweater or a T-shirt.

There are two main ways to take off a sweater. The first is to cross your arms and take the sweater from below. Next, arms rise keeping them crossed to remove the sweater. The other way is to grab the sweater’s neck and stretch while the torso is tilted slightly. In general, women seem to prefer the first way (crossing arms) while men use the second (grabbing). However, no data are available in the literature.

There are important biomechanical differences between these two ways. Crossing arms requires less strength due to lack of friction between the sweater and the body. However, it requires a remarkable torsion of the head of the humerus. By contrast, grabbing the sweater implies an easy movement but the amount of energy to be applied substantially increases. Consequently, the risk for dislocation is substantially different and must be taken into account in order to explain gender differences in the incidence of this kind of trauma.

Here we determined the preferred movement to take off sweaters or T-shirts and the differences between men and women.

Methods

We compared the way to take off a sweater in a population recruited from our own labs, relatives and friends. In addition, the question “How do you take off the sweater?” was raised on-line in a personal blog of one of the authors [3] (http://ciencia.ara.cat/centpeus/2014/02/13/com-et-treus-el-jersei/) and the answers from comments were also included in the casuistic. We excluded people that don’t specify its gender or that claim not to wear sweaters.

Two main ways emerged from the answers: Crossing arms (Figure 1A) and grabbing the sweater (Figure 1B), but a number of people reported other more sophisticated and less usual
ways. For example, start removing from the arms and then carefully take off the sweater through the neck. These answers are included in “other”. All data were collected in an Excel spreadsheet and analyzed by the chi-square test using the Prism 4 software for Windows version 4.02.

## Results

Seventeen males and twenty two females took part in the study. Table 1 shows the number of answers and the corresponding percentages obtained for each possibility in both males and females. There was a clear and significant (p<0.001) difference between men and women on the way to remove the sweater, being the crossing way largely preferred by women while men showed a clear preference for grabbing it. The “other” way is selected in a similar number by women and men but is clearly minority.

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>Crossing</th>
<th>Grabbing</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men (17)</td>
<td>1 (5.9 %)</td>
<td>13 (76.5 %)</td>
<td>3 (17.6 %)</td>
</tr>
<tr>
<td>Women (22)</td>
<td>19 (86.4 %)</td>
<td>0 (0.0 %)</td>
<td>3 (13.6 %)</td>
</tr>
</tbody>
</table>

## Discussion

Although it is generally assumed that there are differences in how men and women remove clothing, this study is the first to provide evidence for the remarkable gender differences in how to take off a sweater. Beyond the social and psychological curiosity, our data indicate a different use of the shoulder joint between genders. The origin of these differences remains unknown, but it seems reasonable to speculate with the differences in the body proportions [4]. The distance between the shoulders is usually the widest point of the human body, being this distance higher in males than in females. A similar difference can be observed in the length of the arms. These differences impose some restrictions when making the motion to take off the sweater.

Grabbing the sweater requires a relevant strength to counteract the friction between the sweater and the back. Consequently, to cross the arms is a more energetically efficient movement. If we add that crossed arms keep hair neatly combed, it is not surprising that this option is mostly chosen by women. By contrast, as men have wider shoulders, the gesture of crossing the arms to remove the sweater makes the elbows remain more distant than in the case of women. This fact imposes an extra tension to the tissue that hinders the movement to take off the sweater.
These data suggests that the higher strength required to take off the sweater in a male-way, and the consequent daily extra effort that undergoes the shoulder, could be related with the known higher incidence of shoulder dislocation and other traumatic lesions observed in men.

**Limitations**

This study has several limitations that must be taken into account. People who participated in the study mostly work in academic and research jobs or actively participate in online forums. Thus, a differential relationship between nerds and their sweaters cannot be excluded.

**Conclusion**

The marked gender differences in the way to take of the sweater must be taken into consideration when interpreting the higher incidence of shoulder injuries shown by men.

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**References**


Figure 1: Two main ways to take off the sweater. (A) Crossing the arms appears to be the preferred movement for women. (B) Grabbing the sweater was the selected option for men.