INTRODUCTION

- In the elderly, hip fractures due to falling result in functional disability, and decrease the quality of life and finally lead to death.
- Nowadays, Korea is entering the aging society, and as the elderly population increases, the social and economic costs due to hip fractures are on the rise.
- Hip protectors that are sold in Korea are imported from the United States and Canada, these are not suitable for the Korean elderly’s body.

PURPOSE OF STUDY

- If the Korean elderly wears imported hip protectors which fitted to westerners, the hip joint may not be protected properly.
- In this study, the survey was conducted to find out the wearing characteristics of hip protectors. The problems of the existing products were identified and the direction of improvement were presented.

METHODS

(1) Questionnaire
- Question items for wearing characteristics based on the results of market research were derived and finally, the questionnaire was made.
- After wearing different kinds of hip protectors, the participants were answering the questionnaire.

(2) Evaluation process
- The evaluation of wearing characteristics was carried out to 100 elderly women at three different senior welfare centers in 2014. The participants’ ages ranged from 60 to 85 years old.

RESULTS

(1) History and characteristics of falling
- 52% of the subject experienced falling in winter. Falling were occurred in outdoors(74.5%), bathroom(10.9%), and kitchen(5.5%).
- Falling were caused mainly during walking (60.4%), wrist joint were the most common fracture site(26%). 24% of injury occurred in knee joint, 16% in lumbar joint, 14% in ankle joint, respectively.

(2) Acceptance of hip protector
- 93% of subjects said that the hip protector was effective in preventing injury(Fig 2-a).
- Necessity of hip protector is tended to increase as age increases.
- The body parts wanted to protect were in several areas: 35.6% for lumbar, 26.9% for hip joint, and 15% for hip bone(Fig 2-b).

(3) Evaluation item
- Characteristics of falling (season, place, cause, activity, direction of falls, and fracture site)
- Acceptance of hip protectors (injury prevention effect, purchase decision, product recognition, necessity, protection areas, and wearing problems)
- Preference (design and details)
- Easy wear (subjective satisfaction)
- Improvement requirements

(4) Evaluation hip protector

<table>
<thead>
<tr>
<th>Belt type</th>
<th>Waist belt type</th>
<th>Underwear type</th>
<th>Slacks type</th>
<th>Pad type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFEHIP® ACTIVE</td>
<td>SAFEHIP® DORSO</td>
<td>SAFEHIP® CLASSIC</td>
<td>HipSaver® SOFT SWEATS</td>
<td>SPOTEC® Pad</td>
</tr>
</tbody>
</table>

DISCUSSION

- To reduce the risk of hip fracture, hip protector needs to be designed in consideration of user's body type and type of fall.
- The pattern and size of hip protector has to be improved in the order of discomfort rate on each part, thigh(52%), waist(28%), chest(13%) and abdomen(7%).
- Objective evaluation is needed for ergonomic design of hip protector based on the analysis of 3D body image of the elderly and shock-absorbing quality of pad.

REFERENCES


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