

Performance of High Seat Chair Cushions - Transflo Cushion

Introduction

Pressure measurements at the interface of skin and support surface have been widely employed by investigators for comparing various beds, mattresses and wheelchair cushions.

Objectives

The purpose of this study was to evaluate the interface pressure over ischial tuberosities where tissue areas are prone to pressure sore development.

Materials and Methods

Three high seat chair cushions supplied by the company Karomed Ltd. were evaluated.

Their construction and dimensions were similar but they were covered with different materials (Table 1).

Cushion including cover	Dimensions L x W x T	Weight	Cover Only		
			Colour	Material	Weight
	mm	kg			kg
1	510 x 470 x 120	2.95	Pink	Woven	0.44
2	505 x 455 x 125	3.29	Grey	Vynide	0.73
3	500 x 460 x 130	3.04	Beige	Velour	0.51

Table 1. Details of cushions compared.

Twelve healthy adult volunteers and sixteen elderly patients participated in the investigation. Their ages, weights and heights ranged from 22 to 89 years, 55kg to 87kg and 161cm to 187cm respectively.

The Oxford Pressure Monitor (Model TM700) was used to measure the magnitude and distribution of pressure each subject exerted while seated on a cushion. A 12-cell pneumatic matrix pad was used under the buttocks for interface pressure measurements. Four lowest readings out of the twelve recorded values from a set were discarded (Fig. 1) before calculating the mean \pm SD.

The data was statistically analysed by use of Students t-test. A difference was considered significant when $p > 0.05$.

Results

Brief details of each cushion are given in Table 1 and the findings of this investigation are summarised in Table 2. All 3 cushions are made of gel-foam composite, each weighing 2.5kg. Their covering materials are different in weight, texture and colour.

Although peak pressure readings were significantly ($p=0.001$) lower for the grey coloured cushion (No. 2), the majority (70%) of subjects showed preference to the cushion covered with velour (No. 3).

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There was no significant difference in either peak pressures or pressure distribution under the buttocks between cushions 1 and 3. Six out of 28 subjects also complained about the piping running on their sciatic nerves on the front edge of the cushions, however, the manufacturers advise that this is not a problem, since all cushions are available without piping.

Comments

The comfort of the cushion appears to be dependent to some extent on the material of the cover. Apart from cushion design and fabrication techniques, the material, texture and colour of the cover are also important factors. It is, therefore, not surprising that the majority of subjects preferred the beige coloured velour cushion (No. 3) instead of the two-way stretch grey vynide covered cushion (No. 2) which gave it the lowest peak pressure readings.

The results of this investigation are encouraging and the elderly people who spend much of the day in a chair should benefit from the Transflo Seating System, both to add to their comfort and to prevent tissue damage.

Cushion	No. of Observations	Interface pressures (mmHg)					
		Peak			Distribution		
		Range	Mean	±SD	Range	Mean	±SD
1	28	37-79	59.6	11.7	31-69	48.6	9.5
2	28	29-59	49.8	7.2	23-54	45.7	8.7
3	28	42-77	57.0	7.5	35-67	47.9	7.1

Table 1. Comparison of ischial pressures.

Talley Medical Ltd.					
Oxford Pressure Monitor					
Patient:	Ward A.C.				
Date:	05.06.90				
Time:	15:30				
Cushion	Interface Pressure (mmHg)				Mean (± SD)
1	35	42	51	56	48.8±7.8
	38	45	43	59	
	27	32	30	56	
2	33	48	32	23	37.7±5.4
	35	39	35	35	
	21	35	31	32	
3	45	53	42	40	47.2±5.7
	49	54	44	10	
	38	44	41	41	

Figure 1. An example of interface pressure recordings on a subject.

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