CASE REPORT

The use of unconventional pressure redistributing cushion in spinal cord injured individuals

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Study design: Case report.

Objectives: To report an unconventional pressure-redistributing cushion used by spinal cord injured individuals.

Setting: Department of Rehabilitation of Medicine, University Malaya, Kuala Lumpur, Malaysia.

Methods: Description of three cases of persons with spinal cord injury (SCI) using unconventional pressure relieving cushions, and despite high pressure noted on pressure mapping they did not develop pressure ulcer.

Conclusion: Education and awareness of pressure ulcer prevention is most important in SCI population, as technology is still an adjunct.

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Keywords: decubitus ulcer; pressure sores; wheelchair cushion; low cost; pressure relief

Introduction

Wheelchair users who depend entirely on wheelchair for mobility especially those with neurological impairment are at risk of developing pressure ulcer. In addition to high cost of treatment, pressure ulcers have negative impact on the rehabilitation process, community reintegration and overall quality of life.¹ Various preventative measures including the use of pressure redistributing cushions are available,² but translating them into practise is another challenge as medical opinions and recommendations may not be followed by the patients. These cases illustrate how patients continued with their own choice of low-cost cushion and not have pressure ulcer.

Case report

Case 1

Mr A is a 47-year-old man with American Spinal Cord Injury Association Impairment scale A C6, secondary to a motor vehicle accident 27 years ago. He is 165 cm tall and weighs 72 kg. He used a motorized wheelchair with a Vespa scooter inner tube (Figure 1) as a cushion for more than 10 years, and sits for an average of 10–12 hours on the cushion.

Case 2

Mr B is a 37-year-old man with American Spinal Cord Injury Association Impairment scale C T8, secondary to a traumatic spinal cord injury (SCI) 10 years ago. He has absent sensation from dermatome level L3. He is 170 cm tall and weighs 78 kg. As a freelance engineer, he sits for ~18 h per day and has been using similar scooter inner tube for the past 5 years. During the first 5 years, he was using another air cushion but was not happy because of its high cost and low durability.

Case 3

Mr C is a 44-year-old man with American Spinal Cord Injury Association Impairment scale A C7 secondary to a motor vehicle accident 20 years ago. He is 185 cm tall and weighs 80 kg. He also uses a similar cushion for more than 15 years and spends ~16 hours daily on the cushion.

All of them are urinary and bowel continent. They perform regular pressure relieving techniques when in sitting position, either a complete lift off, forward lean, or lateral shift on an average in every 10–20 min. On top of that, they also inspect regularly all the at risk body parts for the presence of pressure ulcer. None of them have ever suffered from pressure ulcer since their injury. According to them, the advantages of the scooter inner tube are that it is easier to maintain, of a lower cost and lasted longer compared with the more modern air cushion. Figure 2 shows the pressure mapping of all the cases when they are on the cushion.

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Discussion

Data from the SCI-Model Systems reported rate of pressure ulcer over 20 years to be at 31.9%, with the rate of severe ulcers (grade

Figure 1 The inner tube made from natural rubber used as cushion with an inner diameter of 20 cm and outer diameter of 25 cm.

3 and 4 according to the National Pressure Ulcer Advisory Panel classification) at 4.4%; the commonest sites related to the seated posture are at ischium and followed by sacrum, trochanter and heels.³ An individually prescribed wheelchair with a pressure redistributing cushion are among many prevention methods that are recommended for this population.¹

There are various types of pressure redistributing cushions for prevention and management of pressure ulcers, each with its own properties and advantages.² Some of these cushions can be expensive and need technical support for periodic maintenance. Various materials have been used in producing low-cost cushions from contoured cardboard to dry leaves.⁴ A Tuball cushion made from bicycle inner tubes and plastic balls, costing USD6 was found to be superior to foam cushion and comparable with ROHO cushions in terms of pressure redistributing ability and durability.⁴ The Vespa scooter inner tube illustrated here is produced locally, very low in cost (approximately USD\$4), can last up to a year and only needs periodic air replacement.

Figure 2 Pressure mapping of the three cases sitting on the inner tube. First case: (a) with his own inner tube and (b) with low-profile ROHO air cushion. Second case and third case: (c, e) inner tube and (d, f) with high-profile ROHO air cushion of respective cases.

Once seating system is prescribed, it is the responsibility of the individual to have self-repositioning schedule, proper good nutrition, continence care and a healthy lifestyle. Even though the pressure mapping showed high pressure when sitting on this cushion, these patients were able to lead an active life without having a pressure ulcer despite not having a definite caregiver and a standing wheelchair. They admitted to the importance of regular self repositioning and were using more than one type of self repositioning. However, it is difficult to define the optimal frequency and duration of pressure relief as the traditional pressure relief lift of 15–30 s was found to be ineffective.⁵

Conclusion

Education and awareness on pressure ulcer prevention is integral in management of SCI population and technology is only an adjunct.

Conflict of interest

The authors declare no conflict of interest.

References

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