

Ripple Mattress Performance VS Standard Mattress Performance on Prolonged Bed Ridden Patients

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Abstract: *Ripple mattress or blow up bed is a most effective preventive measure for pressure sores, ripple mattress reduce the share and friction between the bed and patient and safeguard them from pressure ulcers or bed sores. In this study we are assessing the efficiency of ripple mattresses over basic mattress. The study is based over 6 month hospital data of all the respective patient's i.e. patients prone to develop pressure sores. Study involved the various factors influencing the formation of bed sores and their preventive measures. We made study over 80 patients which were divided into two groups based on mattress they used. 50 patients used ripple mattress while 30 patients used standard mattress. Of the 50 patients 5 (10%) had old ulcers, while 3(6%) developed new ulcers, whereas 2 out of 5 patients using ripple mattresses had healing ulcers. On the other hand of the 30 patients using standard mattress 10(33%) had old ulcers while 8(27%) developed new ulcers whereas 4 out of 10 had progressive ulcers. On the finding of ulcers treatment plan was formulated. On receiving treatment all 8(100%) patients using ripple mattress get recovered. while only 6(33%) out of 18 patients on the standard mattress recovered. The studies revealed predominant difference in the healing status of patients using ripple mattress vs. standard mattress. As ripple mattress is more effective and efficient measure for bed sore patients, It should be recommended for early recovery. Ripple mattress is preventive cum treatment modality in ICU and Orthopedics spinal wards.*

Keywords: Ripple mattress, standard mattress, pressure sores.

1. Introduction

Pressure ulcers are local damage to the skin and underlying tissue along with bone exposure sometimes. The ulcers are caused by prolonged pressure along with continuous shearing forces or friction between the bony prominences and bed surface. The most common site involved is sacrum, coccyx, heels, hips, lumbar, spine, though other sites which can be effected includes elbows, knees, shoulder, occipital area. These sores increase the morbidity of the patients and also contribute to patient mortality. The pressure sores can be prevented via reducing the magnitude and duration of pressure forces at the contact area of patient skin and bed surface. These can be achieved by manual log rolling or turning the patients or by repositioning the patient periodically. Sometimes Cushions, mattress overlays, blankets can be made into use.

As continuous shearing forces is the basic Pathophysiological factor for the development of bed sores. An effective care is mandatory to reduce these shearing forces between the patient's body and mattress. The basic mattresses in the hospital setups exert a pressure of 150mm of Hg. This excessive pressure can predispose patients towards bedsores or pressure ulcers. WE need to take measures in order to reduce this undue pressure and this comes in the form of ripple mattress. Other supportive measures include log rolling periodically, maintaining hydration, maintaining adequate nutrition, increasing Hemoglobin via blood transfusion in chronic debilitating patients.

Various risk factors for formation of bed sores include elderly chronically debilitating patients, patients with spine injuries including various vertebral fractures as well associated neurological deficits, quadriplegic patients,

hemiplegic patients, patients suffering from stroke or head injury, patients operated for central nervous system pathology or for spine injuries as well as include ICU patients who are on ventilator support. Apart from this one of the most predominant risk factor is moisture accumulation on skin. Excessive moisture reduces the acidity of the skin and promotes bacterial growth which causes skin degradation and skin ulceration.

Management of skin ulcers at initial stages via early recognition of reddishness of skin, warmth, Discolouration of skin not only improves the general condition of patient but also aids in preventing the need for expensive treatment and equipment's thereby lowering down economical pressure and psychological distress. Use of ripple mattresses in the initial stages of hospital admissions for patients prone to skin ulceration plays a major role in preventing this condition. In the modern scientific era now we have special type of beds to avoid this specific problem.

2. Aim & Objectives

- To protect bed ridden patients from pressure sores which can progress to life threatening ulcers.
- To provide some measure of relief for patients who are suffering from chronic lower back ache.
- To provide a supportive and effective aid in ulcer recovery.
- To entail relief from pain and inflammation through its cushion effect via multiple distribution of forces on skin surfaces.

3. Material & Method

We employed case study method over 80 patients, who were admitted in the hospital for the duration of 6 months from

May 2018 to October 2018. The patients in our study mainly include spine injury Patient's, head injury patients, patients with fracture dorsal lumbar spine, patients in ICU for prolonged ventilator support. The study matrix includes size, shape, and site of ulcers along with duration and intensity of ulcers. After accomplishment of all the data on 80 patients they were tabulated in to two groups based on mattresses used i.e. ripple or standard mattresses. The study is numerically presented in three tables with the significant p value drawn.

4. Results

Our study includes 80 patients divided into two categories i.e. based on mattresses used out of 80 patients, 50 patients used ripple mattresses whereas 30 made into use standard mattresses.

Out of 80 patients 21 patients had sacral and hip ulcers, 8 patients had elbow, 5 cranium ulcers, and 2 patients had ulcers on knee. The average size of sacrum ulcers was 12 cm while that of heel ulcers was 2.9 cm whereas elbow ulcers correspond to 3 cm. Out of 50 patients with ripple mattresses 5 (10%) had old ulcers while 3 (6%) developed new ulcers total 8, (16%).in the second category of patients i.e. 30 patients on standard mattresses, 10 (33.3%) had old ulcers while 8(26.6%) developed new ulcers.

We made a numerical data on respective patients before and after treatment protocol. According to our study before treatment protocol 2 patients out of 5 with old ulcers using ripple mattress had progress towards healing ulcers whereas 4 Patient's out of 10 with old ulcers using standard mattresses progress towards grade 4 ulcers. After suitable treatment protocol that includes regular log roll, wound care, hydration of patients, maintaining room temperature via air conditioning of wards, adequate nutrition status of patients, building hemoglobin more than 10 gm % .Again numerical data was attained on respective patients.

All 8 patients (100%) with ulcers using ripple mattress show full bed sore recovery, while only 6(33%) patients out of 18 patients using standard mattress showed recovery. On the other hand 12 patients (66 %) out of 18 patients not recovered.

Total patient (80)	Old Ulcers	New Ulcers
Ripple mattress (50)	5	3
Standard mattress (30)	10	8

Before treatment protocol

Total bed sore patients(26)	Old Ulcers	Condition of Old Ulcers
Ripple mattress	5	2(healed)
Standard mattress	10	4(grade4 progression)
P value	<0.05, significant	<0.05, significant

After treatment protocol

Total bed sore patients(26)	Recovered	Not Recovered
Ripple mattress	8(100%)	0
Standard mattress	6(33.3%)	12(66.9%)
P value	<0.05,significant	<0.05,significant

5. Discussion

Bed sores also called pressure ulcers are injuries to skin and underlying tissue resulting from prolonged pressure on skin surface. The constant pressure or friction on skin limits the blood supply which leads to its damage and formation of pressure sores. To prevent the occurrence of bedsores among critically ill patients a new generation of mattresses introduced called ripple mattress. This has made the hospitalization phase of patients more comfortable and eases their sufferings. Ripple mattresses reduce the share and friction between the bed and patients thus, safeguard them from pressure ulcers or bed sores. The mattress are designed to heal all stages of bed sore from grade 1 to grade 4.Preventing bed sores is the best defensive against developing bed sores. In this process apart from using ripple mattress other factors should also be taken under consideration like maintaining hygiene, maintaining hydration, using barrier creams, nutritional care, clean clothing and bedding.

Our study demonstrates that the incidence of pressure sores in the patients using standard mattress was significantly higher 22.5% (18out of 80) as compared to the patients using ripple mattress 10 % (8 out of 80). This difference signifies that ripple mattress is more convenient and preventive measure against pressure ulcers. Our study also demonstrates the preventive role of ripple mattress over standard mattress in development of pressure sores. Studies revealed that before treatment protocol 2 patients out of 5 patients with old ulcers using ripple mattress were healing whereas 4 out of 10 patients using standard mattress developed grade 4 ulcers. There was significant p value <0.05 which demonstrates protective capacity of ripple mattresses .studies revealed that after treatment protocol 8(100%) patients using ripple mattress with pressure sores recovered whereas only 6 out of 18(33.3%) patients using standard mattress with pressure sores recovered.there was a significant p value <0.05 which demonstrates the treatment efficiency of ripple mattress over standard mattress.

In conclusion we recommend to use ripple mattress over standard mattress for all high risk patients prone to bed sores as an essential panacea to prevent pressure sores and too augment the treatment protocol efficiency.

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