PILLOW POSITIONING FACILITATES INDEPENDENT BRIDGING FOR BEDPAN USE IN PELVIC FRACTURES

Jeanette Ann Fourie *
Eileen Mary Pat Lief **
Timothy Terence Dunne ***

SUMMARY

The idea of giving a patient with fractures of the pelvis a mechanical advantage, by placing pillows under his/her back in order to make bridging for the bedpan easier, was tested in this clinical trial. Twenty nine subjects were entered by block randomisation into the experimental group and twenty nine into the control group. The number of days from entry into the trial until independent bridging was noted. Independent bridging is defined as the patient being able to lift high enough to slide a conventional stainless steel bedpan under the buttocks. Results show that there is a significant difference in time to bridging ($\Upsilon = 0{,}602$, $p = 0{,}0027$) in favour of the experimental group. Other variables studied appear to marginally favour the control rather than the experimental group, thus suggesting that the pillow method could be used safely and effectively in the treatment of patients who have sustained a range of pelvic fractures.

OPSOMMING

Die idee dat 'n pasiënt met bekkenfrakture 'n meganiese voordeel gegee kan word, deur kussings onder die rug te plaas, om brug vir gebruik van 'n bedpan te vergemaklik, is tydens hierdie kliniese proef ondersoek. Nege en twintig proefpersone is volgens die ewekansige blok toekennings metode, aan die eksperimentele en kontrole groepe toegewys. Die aantal dae vanaf opname in die proef tot onafhanklike brug is aangeteken. Onafhanklike brug behels dat die pasiënt in staat is om hoog genoeg te lig ten einde 'n konvensionele vlekvrye staal bedpan onder die sitvlak in te gly. Resultate toon 'n beduidende verskil t.o.v. die tyd tot onafhanklike brug ($\Upsilon = 0{,}602$, $p = 0{,}0027$) ten gunste van die eksperimentele groep. Ander veranderlikes wat ondersoek is, is gering meer in die guns van die kontrole - eerder as die eksperimentele groep. Dit wil dus voorkom dat die kussingmetode wel veilig en effektief gebruik kan word in die behandeling van pasiënte met bekkenfrakture van 'n soortgelyke omvang as wat in hierdie reeks gesien is.

INTRODUCTION

An extensive literature search revealed very little published material on assisting the patient suffering from pelvic fracture(s), with the necessary function of bedpan use as an aspect of being bedridden for approximately six weeks. Difficulties with bedpan use, and associated pain, depend on the severity and configuration of the pelvic fractures. Betts-Symonds suggests that the patient be allowed to open his bowels onto an incontinence sheet, when pain and immobility in bed prevent bedpan use. However "The very idea of this may prove to be distasteful to the patient"(p 173)[1].

The authors found that in the clinical arena, patients are often lifted onto the bedpan by the nursing staff. Such lifting causes further discomfort and pain, but is considered better than suffering from constipation.

Supreme effort would be required to suspend the trunk and pelvis by the arms from a monkey chain. This technique can be used, by the athletic young patients with less severe fractures of the pelvis. However, it is not feasible in general.

Pillow positioning under the upper trunk is proposed as a possible alternative to incontinence sheets and to lifting. The underlying mechanism by which the effect of the pillow positioning is mediated, is thought to be the result of the extensor muscles of the lower back and hips (hamstrings, gluteus maximus and erector spinae) coming into action to support and lift the fractured pelvis from the bed, rather than the flexor muscles which would have the effect of suspending the fractured pelvis. Further, with pillow positioning the patient is in a horizontal supine position, which makes evacuation of the bowels easier than with buttocks higher than shoulders, as is the case without the use of pillows. The usual method of evacuation is in a sitting position, which is gravity assisted. The first author has observed the patient's distress when attempting to evacuate.

METHODOLOGY

The trial was conducted between February 1990 and July 1991 in Cape Town in the Groote Schuur Hospital Orthopaedic wards. A total of 80 men and women who had sustained fractures of the pelvis were sequentially allocated by prior block randomisation to experimental and control groups.

Written consent was obtained from the Medical Superintendent of Groote Schuur Hospital, as well as the Department of Orthopaedics and the design was approved by the University of Cape Town Ethics Committee. Informed consent from the patient was obtained verbally.

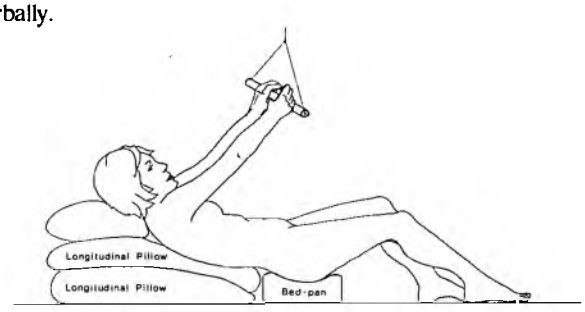

Fig.1 PILLOW POSITIONING FOR BED-PAN FOR THIS PATIENT

FIG 1: PILLOW POSITION FOR BED-PAN FOR THIS PATIENT

Initially, the group of physiotherapists assigned to the orthopaedic wards decided on the protocol to be used for the trial, with the first author. A proforma was drawn up for each patient's details, and a diagram drawn to be placed above the bed of each experimental group patient. The diagram was intended as a reminder to all staff treating the patient, of the method of pillow positioning during bedpan use for that particular patient (Fig 1). The methodology was checked by appointment, to ensure standardisation. Any new staff or students to the wards were orientated to the procedure, which was restricted to the experimental group.

All patients entered into the trial were given an explanation of the importance of being able to use the bedpan whilst confined to

* *Dip (Physiotherapy), Dip Teaching Physiotherapy, Lecturer in Physiotherapy, University of Cape Town*
** *BSc (Physiotherapy), Chief Physiotherapist, Groote Schuur Hospital*
*** *BA (Hons), BSc (Hons), UED, BEd, PhD (Mathematical Statistics), FIS, Dept of Statistical Sciences, University of Cape Town*
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bedrest, in order to avoid constipation (and catheterisation for women, with its consequent potential for infection). A monkey chain was provided to ensure the maximum amount of mobility in the bed for each patient.

At the end of the trial 58 cases were evaluated. Exclusion were necessitated by: death – 1, missing proforma – 10, spoiled proforma – 6, discharge before completion of trial – 4, and severe pain on any movement, due to a fragment of bone in the joint – 1.

The purpose of a designed clinical trial of the type described, is two-fold: firstly, to discover if an apparent effect is associated with the intervention, so that the experimental group achieves bridging earlier than the control group; and secondly, should there appear to be such an association, to lend support to the inference that the cause of the association is the intervention itself.

In other words, the authors hope to demonstrate an improvement in the experimental group and to reasonably infer that the mechanical advantage of the pillow positioning is the cause of the improvement.

TREATMENT PROCEDURE

Experimental Group

The commands given to the patient were as follows:

- "Pull with both hands on the monkey chain to raise your head, shoulders and back off the bed", (enough to allow the therapist to slide two pillows lengthwise between patient and bed, supporting from waist to head).
- "Raise your head" (enough to position one more pillow horizontally under the head to provide further spine flexion. See Fig 2).

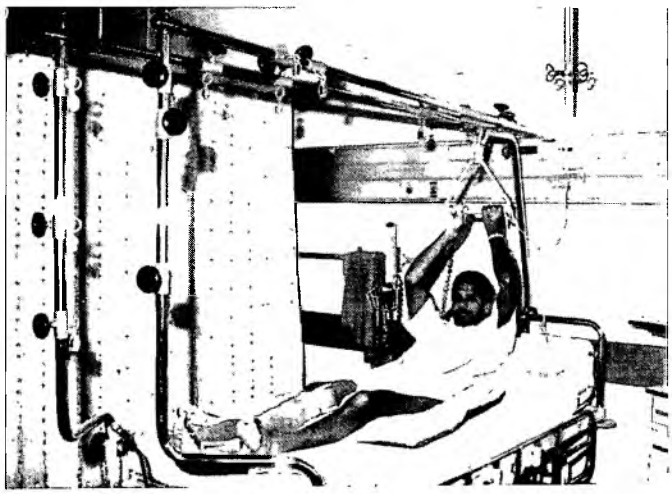

FIG 2: LIFTING TRUNK AND SHOULDERS FOR PILLOW POSITIONING

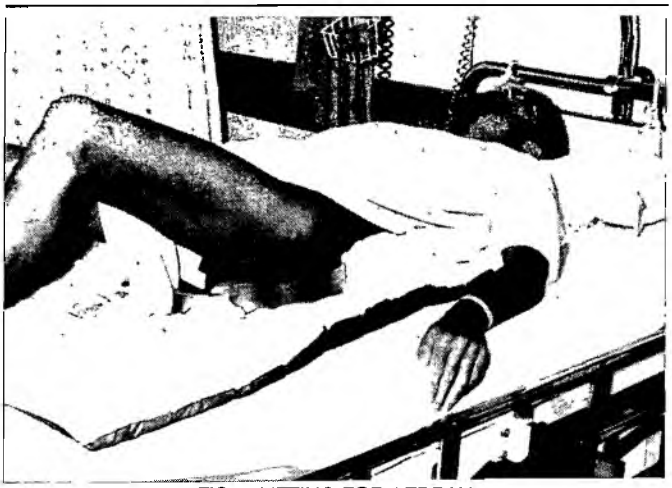

FIG 3: LIFTING FOR BEDPAN

- "Release the monkey chain and push extended arms onto the mattress, head back, knees bent and lift the buttocks from the bed". (Bedpan is slid into position at this point provided the patient can lift buttocks high enough. See Fig 3).

Control Group

The control group was asked to bend their knees and raise their buttocks from the bed by pushing downwards on the feet and extended arms, in the usual manner, without any pillows positioned under their backs.

DATA COLLECTION

The number of days from entry into the trial until independent bridging was taken as the outcome (dependent) variable. Demographic data is presented in Table I. Explanatory variables are listed in Table II.

These variables were considered to have possible effects on the time to bridging. All data for each patient was recorded on the proforma by the physiotherapist or student who was treating the patient. This was part of the documentation kept by the ward staff in a file at the patients' bedside.

RESULTS

Table I presents data on demographic variables and Table II clinical variables which might be associated with changes in time to bridging. The experimental and the control groups do not appear to differ substantially on any of these variables.

TABLE I: DEMOGRAPHIC DATA

VARIABLE	EXPERIMENTAL GROUP	CONTROL GROUP
Numbers	29	29
Age (mean ± SD) years	32,0 ± 9,7	32,6 ± 14,5
Gender male:female	19 10	16 13
Build: athletic, average, obese	8 19 2	9 14 5
Work: labour, factory, sedentary	11 11 7	8 10 11
Fitness: low, average, high	14 11 4	14 7 8

TABLE II: EXPLANATORY VARIABLES

VARIABLE	EXPERIMENTAL GROUP	CONTROL GROUP
Delay to entry: (Mean ± SD) days	6,1 ± 4,4	9,2 ± 6,4
Cause of injuy: MVA, other	17 12	10 19
Fracture area: weight-bearing, other	23 6	17 12
Unstable, stable	19 10	14 15
Orthopaedic management: traction, bedrest, open reduction	10 13 6	8 14 7
Associated fractures: femur/tibia/fibula, none	16 13	11 18
Pelvic organs: injuries, none	7 22	6 23
Cather: yes, no	8 21	10 19
Morphine: on day of bridge, no analgesics	6 23	11 18
Pain: moderate–severe, mild	2 27	4 25

Table III gives evidence of substantial apparent effects, with the experimental group showing markedly shorter periods to bridging.

The Pearson $X^2 = 14{,}178$ statistic indicates that the experimental and control groups differ in having unequal probabilities associated with each of the bridging periods. The Gamma statistic is a measure of the strength of the advantageous relationship between the intervention and the period to bridging. A perfect advantageous relation-

ship would yield $\Upsilon = 1.00$ on a suitable set of time to bridging classes. In contrast, $\Upsilon = 0.00$ indicates the absence of any relationship, and $\Upsilon = -1.00$ an exact inverse relationship between intervention and time to bridging[2]. Here the value $\Upsilon = 0.602$ indicates that the observed differences of the Pearson's test are attributable to shorter bridging periods for the experimental group.

TABLE III: TIME TAKEN TO ACQUIRE INDEPENDENT BRIDGING

DAYS	0	1–3	4–7	>7	
EXPERIMENTAL	18	5	5	1	29
CONTROL	6	10	4	9	29
Pearsons X^2 = 14,178 p = 0,0027					
Gamma Υ = 0,602 ASE = 0,140 t = 3,789 p < 0,005					
Mann-Whitney z-statistic = 2,82 p < 0,01					

The Mann-Whitney U-test gives rise to a z-statistic of 2,82, which is significantly different from zero.

The Mann-Whitney test for differences between the response time to bridging between the two groups is appropriate here, as it presumes no distributional information[3]. It too establishes marked evidence of lower bridging time with the experimental group.

DISCUSSION

The improvements in the experimental group might possibly have been associated with other important clinical factors. No such association was established between the time to bridging and any of the variables recorded in Tables I & II.

Furthermore, in the random allocation of individual patients to the experimental and control groups, it transpired that none of these explanatory factors were advantageously associated with the experimental group, and such minor non-significant differences as did occur, seemed to favour the control group, in the sense that the controls might have been expected to bridge marginally earlier.

Consequently, the inference can be made that the apparent earlier bridging of the experimental group is attributable to the intervention constituted by the pillow positioning, presumably through the mechanical advantages it affords to the patient.

The implications of these positive findings may:

- justify standard use of pillow positioning for patients with pelvic fractures;
- facilitate the use of the bedpan through reducing the pain and discomfort experienced in lifting the buttocks, among such patients;
- encourage the functional use of the hip muscles (adductors, internal rotators, flexor-iliacus) which, due to inhibition, because of their origin on the fractured bone, begin to act as synergists only and later, when union is sufficient, allow agonistic and antagonistic action. (This claim is as yet unproved theory, but seems the most likely explanation why the affected leg lies in abduction and lateral rotation for approximately the first 10 days post fracture);
- reduce the likelihood of decubiti as a result of reducing continuous pressure on the buttocks; as evidenced in this trial;
- facilitate movement in bed, which will assist nursing processes such as changing linen and pressure care;
- provide an educational advantage for nursing and physiotherapy students, by the use of simple, readily available equipment to assist patients
- improve the health professional-patient interaction through the application of a simple, caring, helpful method of mechanically assisting the patient, with bed-pan use at a time when he/she feels vulnerable and out of control of his/her life.

REFERENCES

1. Betts-Symond GW. *Fracture Care and Management for Students*, Macmillan 1984.
2. Goodman LA, Kruskal WH. *Measures of Association for Cross-Classification*, Springer-Verlag 1972.
3. Daniel WW. *Applied Non-Parametric Statistics*, Houghton Mifflin 1978.

PRACTICAL IMMUNOLOGICAL FOCUS FOR 1992 ALLERGY CONGRESS

Advances in the field of allergy and immunology with practical impacts on the testing, diagnosis and clinical management of allergy will be a major focus at the 1992 Allergy Congress to be held in Cape Town on 24 & 25 September.

Five prominent overseas experts will participate in the formal sessions of the Allergy Congress and contribute to the practical sessions to be held on in vivo skin testing and in vitro office laboratory testing. Among these are Prof SGO Johannson of Sweden who revolutionised laboratory testing; Dr IA Emmanuel, expert on nasal allergy and sinusitis from San Francisco, and Dr Frederik Spieksma, Head of the Laboratory of Aerobiology at the University of Leiden recognised for his characterisation of the house dust mite, who will discuss current concepts regarding the allergenicity of dust mites.

The immune response and its mediators and the clinical efficacy of immunotherapy will be dealt with by Prof Staffan Ahlstedt, Professor of Immunology at the Swedish University of Gothenburg and Dr Hans-Jorgen Malling, member of the WHO working group on allergen immunotherapy and consultant physician at the National University Hospital, Copenhagen.

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For further information contact the Congress Secretariat, Mrs Deborah McTeer, Post-graduate Medical Centre, (021) 47-1250 ext 348.

INTERNATIONAL CONGRESSES

World Congress of Diseases of the Chest – Amsterdam; 13-18 June 1993. International Academy of Chest Physicians and Surgeons of the ACCP, 3300 Dundee Road, Northbrook, IL 600062-2348 USA. Deadline for Abstracts; 1 October 1992.

World Congress of Gerontology – Budapest; 4-9 July 1993. Secretariat, Budapest Convention Centre, H-1444 Budapest, Hungary, POB 233. Registration before 15 January 1993.

International Conference on Physiotherapy – Hong Kong; 23-25 July 1993. "The Science and Art of Physiotherapy". Conference Secretariat, G/F, 254 Tung Choi Street, Kowloon, Hong Kong. Call for papers.

PROFESSIONAL BOARD FOR PHYSIOTHERAPY

Nominations will be called for towards the end of the year for the new Professional Board for Physiotherapy. This will be gazetted some time in December and prospective nominees must ensure that they submit their name and address exactly as these are registered with the SAMDC. Voting papers will be sent to all registered physiotherapists by the SAMDC early in the new year.

If any member of the SASP are considering standing for election to the Board, they should send a short curriculum vitae to the SASP headquarters before the end of September. These will be published by the Society so that our members can make an informed choice when voting for the new Professional Board. It is important that consideration is given to the composition of the Board which should include physiotherapists from all fields of practice to allow the Board to function efficiently.