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ORIGINAL ARTICLE

Effect of plaster corset in acute low back pain in less developed country

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Abstract *Aim of the work:* To evaluate the effect of plaster corset in patients with acute low back pain (LBP) in the Rheumatology Department of National Hospital University Hubert Koutoukou Maga of Cotonou (Benin).

Patients and methods: A prospective case-control study was conducted from January 2012 to June 2013. The selected patients suffered from acute low back pain and were treated with plaster corset for thirty days associated with medical drugs compared to a control-group with the same disease treated only with medical drugs. Demographic data, clinical parameters and outcomes during six months were collected. The primary endpoint was the reduction of visual analog score (VAS) for pain and the functional disability was evaluated using the EIFEL score.

Results: Thirty-three patients were recruited in the plaster corset group (PG) and 34 patients of matched age and sex in the control group. The mean VAS was 86.7 ± 21.3 and 88.3 ± 20.2 respectively in the "PG" and "CG". The results showed a significant decrease of VAS after 3 months in PG than in the CG ($p = 0.023$) but no significant difference was present after 6 months. The EIFEL score significantly decreased in the PG compared to the CG after 6 months. The number of patients who did not take any medication after three months was higher in the PG in contrast to the CG (27 patients versus 12).

Conclusion: Plaster corset can be complementarily used in addition to the medical treatment to decrease the pain and functional disability and can help to reduce work stoppage.

1. Introduction

The prevalence of low back pain (LBP) is estimated at between 35 and 50% in both industrialized and less developed countries [1–3]. A high prevalence of LBP (74.5%) among Tunisian hospital staff was recently reported [4]. It is a public health problem because of the socio-economic losses. The effects are more important in the acute phases due to significant impairment of quality of life [2,5]. Evolution of LBP is frequently quickly

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favorable in few days with frequent risk of recurrence [6]. Many propositions of treatment combined with immobilization and pharmacological drugs are used to reduce the pain to enable fast resumption of occupational and personal activities. The effectiveness of lumbar orthosis (corsets or belts) is controversial [7–9]. The role of lumbar supports for prevention and treatment of low back pain was reviewed by Van Duijvenbode et al. [10].

This study aims to evaluate the effect of plaster corset in patients with acute low back pain in the Rheumatology unit of the National University Hospital: Hubert Maga Koutoukou (NHU-HKM) of Cotonou.

2. Patients and methods

This was a prospective case-control study conducted from January 2012 to June 2013 in the rheumatology unit of the National Hospital University: Hubert Koutoukou Maga of Cotonou. The patients between 18 and 65 years old were recruited over a period of 12 months and those who took part met the following criteria:

- Having been consulted in the hospital rheumatology unit during the study period.
- Suffered from acute back pain (pain duration was less than 6 weeks [11]).
- No contraindications to step I or step II analgesics (according to Word Health Organization pain ladder [12]), non-steroidal anti-inflammatory drugs, benzodiazepines and thiocolchicoside.
- Signing the consent form after being explained to them.
- Respected the follow-up visit for 6 months.

The exclusion criteria were applied for patients with any of the following:

- Nerve root pain.
- Suffered from LBP during the year before.
- Performed a spinal operation.
- LBP related to infection, inflammatory diseases or malignancy.
- Pregnancy.

The patients were randomly grouped. The first group called 'plaster group' (PG) treated with plaster corset for 30 days in addition to using the medical drugs including analgesics, anti-inflammatory and myorelaxant. The second group was the 'control-group' (CG) that received only medical treatment. The analgesics used included tramadol or acetaminophen combined with codeine and the anti-inflammatory drugs used were diclofenac, ketoprofen or piroxicam. Thiocolchicoside was the myorelaxant used for the study.

Analgesic treatment (especially acetaminophen) was maintained throughout the study period upon request while the muscle relaxant thiocolchicoside was stopped after two weeks of continuous take. No complications were encountered after providing the plaster corset and no further medications were required.

Fitting of the plaster corset: *In front*, the corset goes from the pubic area to the lower tip of the sternum. It envelops the lower part of the chest under the breasts and forces the patient to recover. The lower cut allows the patient to sit, legs at 90 degrees. *From the back*, the upper cutting edge passes under the shoulder blades with a lower cutting so that the patient can sit. To allow easy sitting, a finger's breadth is left between the seat and the bottom edge of the corset, not to pinch the buttocks. The corset should be well applied to the lower back and tight in the abdominal region (Figs. 1 and 2).

2.1. Scales

- The pain VAS: It is measured on a 100 mm horizontal scale from 0 (no pain) to 100 (maximal pain).
- The EIFEL scale: It is a valid and reliable self-questionnaire for assessing functional capacity in low back pain [13]. It is the French version of the Roland-Morris scale 10. It consists of 24 questions. The patient must answer each question in function of the difficulty applicable on the day the questionnaire is completed. Each question equals 1 point and the total EIFEL score corresponds to the sum. Thus, a score of 24 corresponds to the most unfavorable situation (total functional incapacity associated with their low back pain).

Data collection was done initially, using a survey form which identified the general characteristics (age, sex, occupation, address, visual analog scale and EIFEL score) of the two groups. The VAS for pain of patients was recorded in three follow-up visits at one, three and six months. The primary endpoint was the reduction of visual analog score (ΔVAS). The study evaluated also the reduction of EIFEL scale and medical consumption.

The patients provided informed consents and ethical approval was obtained.

Statistical analysis: Data was analyzed using EpiData and SPSS17.0 software. Student's test was used to compare the differences between both groups. Chi square test was performed to compare between two qualitative variables. Statistical significance was set at $p < 0.05$. The data were expressed as frequency, range, mean ± standard deviation (S.D.).

Figure 1 A photo of a female patient with low back pain wearing plaster corset (from the front and back).