PAIN® 153 (2012) 197–202

PAIN®

www.elsevier.com/locate/pain

Gender differences in outcomes of a multimodal pain management program

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Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

ARTICLE INFO

Article history:
Received 26 July 2011
Received in revised form 3 October 2011
Accepted 10 October 2011

Keywords:
Pain
Gender differences
Multimodal treatment
Treatment outcome

ABSTRACT

Although gender differences in pain and analgesia are well known, it still remains unclear whether men and women vary in response to multimodal pain treatment. This study was conducted to investigate whether men and women exhibited different outcomes after an intensive multimodal pain treatment program. The daily outpatient program consisted of individual treatment as well as group therapy, with a total amount of therapy of 117.5 h per patient. Overall, 496 patients (254 women) completed the multimodal program. Pretreatment parameters for pain, disability due to pain, pain duration, and pain chronicity stage, as well as age or psychiatric comorbidities, did not differ between genders. The average pain, measured with a Numeric Rating Scale, decreased after treatment of −1.54 (±1.96) with a large effect size (ES) of .911 for the total sample. However, there were considerable differences in the benefit for women (−1.83 ± 2.12; ES 1.045) compared with men (−1.23 ± 1.74; ES .758). Consistently, women (ES .694) improved more in pain-related disabilities in daily life than men (ES .436). These distinctions are not due to differences in pain duration, received medication, psychiatric comorbidities, pain chronicity stage, or application for a disability pension. Therefore, gender differences not only refer to chronic pain prevalence, pain perception, or experimental pain measurement, but also seem to have a clinically relevant impact on the response to pain therapy.

1. Introduction

Gender differences in pain perception are well described in the literature. Studies with representative samples showed a higher prevalence of women suffering from chronic pain compared with men [9]. Furthermore, women report more intense and frequent pain than men [34] and appear more likely to experience pain in multiple body regions [3].

Meanwhile, a great number of studies analyzed gender differences in experimental pain. To date, there is strong evidence that female subjects are more sensitive to pressure, heat, and cold pain stimuli [9]. This coincides with data showing more efficient diffuse noxious inhibitory controls for male than female subjects [30].

Concerning the response to opioid and nonopioid medication, numerous experimental studies provided no consistent evidence for gender differences [9]. A recent review and meta-analysis revealed a greater morphine-induced analgesia for women in both experimental pain studies and clinical patient-controlled analgesia studies [28]. Data from the investigation of nonpharmacological pain intervention and gender distinctions are rather rare. A study showed a greater benefit in men receiving conventional physical therapy [16], whereas women seem to profit more from cognitive behavioral therapy [23].

Although outcomes of interdisciplinary pain management have been thoroughly studied [10], reliable data on gender differences are still lacking. Krogstad et al. showed a persistent reduction in orofacial pain only for women 2 years after treatment [26]. Accordingly, Jensen et al. found gender differences in quality of life after a rehabilitation program for chronic spinal pain [23]. Another study found a similar reduction in pain intensity in both sexes after interdisciplinary pain management, with only men remaining stable in the outcome after 3 months, whereas women worsened to pretreatment scores [25]. Fibromyalgia patients showed a better outcome in some scales of the Short Form Health Survey (SF-36) for men compared with women in a study by Hooten et al. [18].

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0304-3959/$36.00
doi:10.1016/j.pain.2011.10.016

Although it is likely that men and women benefit unequally from pain management, evidence for specific gender differences is still weak. Consequently, the Sex, Gender and Pain Special Interest Group of the International Association for the Study of Pain (IASP) stated as a main goal for future research the determination of gender differences in outcome when similar treatments (pharmacological, interventional, and behavioral) are applied [15]. Within this consensus report, the investigators gave recommendations for studying sex and gender differences in pain and analgesia [15]. Considering these recommendations, the current study was conducted to analyze the impact of gender on the outcome of a multimodal pain management program.

2. Methods

2.1. Participants

Data from all patients who completed a pain management program from 2006 to 2010 at the pain clinic in Weiden, Germany, were analyzed retrospectively. An outpatient visit for clinical diagnostics preceded the program. This visit consisted of a diagnostic evaluation by a physician, a nurse, a specialist for psychosomatic medicine, and a physical therapist, all with special knowledge in pain therapy. Inclusion criteria were defined as follows: (1) patients agreed to be admitted and to participate in all treatment units; (2) chronic nonmalignant pain that existed for over 6 months (independent of type or region of pain); (3) appropriate linguistic understanding; (4) a clear level of suffering and a manifest or imminent reduction of quality of life; (5) failure of a previous unimodal pain therapy or surgery because of pain; (6) no other pain treatment (for example inpatient or psychiatric treatment) that appeared to be more sufficient.

2.2. Treatment

The 5-week multimodal pain program was comprised of physicians, psychologists, physical therapists, a nutritionist, a social worker, and relaxation therapists. The medical staff consisted of an anesthetist, a neurologist, and a specialist for psychosomatic medicine and psychotherapy. An average of 8 patients was included in each group. The daily outpatient program lasted from Monday to Friday (8 am to 4 pm) and consisted of individual treatment as well as standardized group therapy. The main modules of the CBT-orientated group program are (1) acceptance, (2) development of resources, (3) resolving conflicts and strengthening social competency, (4) stabilization, and (5) implementation in daily life. The entire amount of therapy per patient was 23.5 h per week and 117.5 h per program, respectively.

2.2.1. Individual treatment

- *Doctor's appointment*: 0.5 h twice per week.
- *Physical therapy*: 0.5 h twice per week.
- *Psychotherapy*: 1 h/week.

2.2.2. Group treatment

- *Relaxation techniques (e.g., progressive muscle relaxation according to Jacobson or autogenics)*: 3.5 h/week.
- *Physical therapy*: 8 h/week
- *Cognitive behavioral therapy*: 6 h/week.
- *Pain education*: 2 h/week.
- *Nutrition advice and social counseling*: 1 h/week.

2.3. Pain chronicity stage

The validated Mainz Pain Staging System (MPSS) [11,13] was used to determine pain chronicity stage at the beginning of the treatment (time 1). The MPSS distinguishes 3 pain stages (from 1 to 3), considering temporal and spatial dimensions of pain, medication usage, and lifetime utilization of the health care system [14].

2.4. Pain measurement

At the beginning (time 1) and end (time 2) of the pain program, the following self-rating instruments were assessed to measure pain and resulting disabilities:

Numeric Rating Scale (NRS): An 11-point numeric scale, scored 0 (no pain) through 10 (worst possible pain) to rate minimum, average, and maximum pain within the past 4 weeks [7,23]. The NRS is a valid and reliable method of measuring pain [22] that is recommended for use in patients with chronic pain [20,24].

Pain Disability Index (PDI) in the validated German version [4]: This is a self-rating instrument to assess pain-related disabilities. The respondent rates the degree to which pain interferes with functioning from 0 (no disability) to 10 (total disability) in 7 broad areas: family/home, responsibilities, recreation, social activity, occupation, sexual behavior, self-care, and life-support activity [33].

2.5. Additional investigated parameters

Because disability pension is thought to influence the therapy outcome [1], the patient's statement regarding whether he or she had applied for such assistance was documented. Possible psychiatric comorbidities (according to the International Classification of Diseases, 10th Revision) were evaluated by a specialist in psychosomatic medicine and psychotherapy. The diagnosis was made by a standardized semistructured psychiatric interview according to the International Classification of Diseases, 10th Revision, symptom checklist for mental disorders.

The following tests were completed by only a fraction of the patients in the study and were included to contribute to the clinical impression of the results: (1) the German version of the Center for Epidemiological Studies Depression Scale [27], the Allgemeine Depressionsskala (ADS) [17] (N = 447), and (2) the SF-36 [35] (N = 111).

2.6. Pain medication

Individual medication was adjusted at the doctor's appointment according to the recommendations of the World Health Organization analgesic ladder for cancer pain [38]. The medication was recorded without a further specification for substance or doses for (1) opiates, (2) nonopioid analgesics, and (3) coanalgesics (such as muscle relaxants, antidepressants or anticonvulsants).

2.7. Statistics

For the statistical analysis, we used SPSS version 18.0 (SPSS Inc., Chicago, Illinois, USA). Two-tailed significance level was set at .05. All variables were tested for normal distribution with a Kolmogorov-Smirnov test. Mean values and standard deviations were counted with a descriptive statistic, and cross tables were used for frequencies in case of ordinal variables. For comparison before and after treatment, we performed a paired t test and a Wilcoxon