

Ocena poziomu lęku i depresji oraz natężenia bólu u pacjentów z chorobą zwyrodnieniową układu ruchu

Assessment of the level of anxiety, depression and pain intensity in patients with osteoarthritis of the limbs through spa treatment

Jadwiga Kuciel-Lewandowska^{1(A,B,C,D,E,F,G)}, Małgorzata Paprocka-Borowicz^{1(A,B,C,D,F)},
Wojciech Laber^{1(B,C,D,E,F)}, Mateusz Kowal^{1(B,C,D,E)}, Krzysztof Szarejko^{2(B,C,D,E,F,G)},
Krzysztof Aleksandrowicz^{1(A,B,C,D,E,F,G)}

¹Katedra Fizjoterapii, Wydział Nauk o Zdrowiu, Uniwersytet Medyczny im. Piastów Śląskich we Wrocławiu, Polska/Department of Physiotherapy, Wrocław Medical University, Wrocław, Poland

²NZOZ Zakład Fizykoterapii i Rehabilitacji Leczniczej, Białystok, Polska/Non-Public Health Care Institution, Institute of Physical Therapy and Rehabilitation, Białystok, Poland

Streszczenie:

Wstęp. Przewlekły ból jako konsekwencja choroby zwyrodnieniowej narządu ruchu należy do czynników prowokujących i prowokujących zaburzenia lękowo-depresyjne. Zarówno ból jak i zaburzenia lękowo-depresyjne stanowią czynniki wzajemnie nasilające się, znacząco ograniczają sprawność ruchową i obniżają jakość życia. Schorzenia narządu ruchu stanowią poważny problem terapeutyczny. Stan przewlekły, brak poprawy w ustępowaniu dolegliwości i brak możliwości powrotu do życia społecznego oraz pracy zawodowej stanowi również poważny problem ekonomiczny.

Celem pracy jest ocena wpływu balneofizjoterapii na poziom lęku i depresji oraz poziom odczuwania bólu u pacjentów z chorobą zwyrodnieniową stawów obwodowych i stawów kręgosłupa.

Materiał i metody. Badania wykonano przed wprowadzeniem kompleksowej terapii i po jej zakończeniu. Zakres prowadzonych obserwacji obejmował:

- ocenę poziomu lęku i depresji z zastosowaniem standardowej Skali Lęku i Depresji HADS,
- ocenę bólu – skala bólu VAS,
- wywiad chorobowy i socjodemograficzny.

Obserwacją objęto 120 osób ze schorzeniami narządu ruchu leczonych w uzdrowisku Przerzeczyn-Zdrój. W badaniu uwzględniono również obserwację 21-osobowej grupy kontrolnej leczonej ambulatoryjnie. W czasie 21-dniowych turnusów leczniczych zastosowano zabiegi fizykalne, kinezyterapię oraz naturalne surowce lecznicze: borowinę i wodę leczniczą radonowo-siarczkową. U pacjentów leczonych w ramach Poradni Rehabilitacyjnej nie stosowano balneoterapii.

Wyniki. W wyniku terapii uzdrowskiej oraz terapii prowadzonej ambulatoryjnie uzyskano poprawę w zakresie obniżenia poziomu lęku i depresji oraz uzyskano zmniejszenie natężenia odczuwanego bólu.

Wnioski. 1. Leczenie uzdrowskie oraz leczenie prowadzone ambulatoryjnie wpływa na obniżenie poziomu bólu, lęku i depresji u pacjentów z chorobą zwyrodnieniową narządu ruchu. 2. Większą skuteczność w zakresie obniżenia poziomu bólu, lęku i depresji stwierdzono w wyniku terapii prowadzonej w uzdrowisku.

Słowa kluczowe:

choroba zwyrodnieniowa narządu ruchu, lęk, depresja, terapia uzdrowska, skala HADS i VAS

Abstract

Introduction. Chronic pain as a consequence of osteoarthritis of the limbs is one of the factors provoking anxiety-depressive disorder. Both pain and the anxiety-depressive disorders are factors mutually escalating, which at the same time significantly restrict the mobility and quality of life. Musculoskeletal system diseases represent a serious therapeutic problem. Chronic condition, the lack of improvement in treatment of negative symptoms and inability to return not only to social life but also to work is also a serious economic problem.

The aim of the study was to evaluate the effect of the spa treatment on the anxiety, depression and the pain perception level in patients with degenerative joint disease and osteoarthritis of the spine.

Materials and methods. The research was conducted before the introduction of complex therapy and after its completion. The range of observations included:

- Assessing the level of anxiety and depression using a standard Hospital Anxiety and Depression Scale HADS,
- Assessing pain - VAS pain scale,
- medical and socio-demographic history.

The observation comprised 120 patients suffering from osteoarthritis of the limbs in the Przerzeczyn-Zdrój spa. The study also included observation of the control group consisting of 21-persons treated on an outpatient basis. During the 21-day stays at the spa there were physical treatments, physiotherapy and natural healing materials used such as peloid mud and medicinal radon-sulphide water. Patients treated in the Rehabilitation Clinic did not undergo balneotherapy.

Results. As a result of the spa therapy and treatments performed on an outpatient basis the levels of anxiety and depression were lowered whereas the pain intensity level was decreased.

Conclusions. 1. Spa treatment and the treatment conducted on an outpatient basis, lowers the level of pain, anxiety and depression in patients with osteoarthritis of the limbs.

2. As a result of the research it was found that more effective, in terms of reducing the level of pain, anxiety and depression, was the treatment carried out at the spa.

Key words:

osteoarthritis of the limbs, anxiety, depression, spa therapy, HADS scale and VAS

Introduction

Spa treatments aim to provide complex therapy to different motor organs and other system disorders, as well as psychotherapy. Chronic pain is a symptom of osteoarthritis of the limbs and is a main factor provoking depressed moods and escalating anxiety. Such conditions may lead to anxiety-depressive disorders, limiting and delaying recovery and return to social life and work, and in turn relating to serious economic problems.

Except for somatic symptoms, chronic ailments have a serious influence on human mental health. A stress-generating factor, chronic conditions may lead to several mental disorders, such as: anxiety or depression, as observed in dejection and aggression [1]. Mood disorders and fear of somatic disorders frequently occur simultaneously in such fields as: cardiology, dermatology, oncology, pulmonology and metabolic (e.g. diabetes), as well as motor organ disorders [2, 3, 4]. It seems pain plays a key role in provoking negative psychiatric reactions. A well known definition of pain describes it as a subjective phenomenon, and ascribes it to a mental sphere dependent on the neurological background. Pain felt inside the body instantly raises anxiety and fear of one's health. Pain itself is often associated with disease, which is why it provokes strong fear and triggers the strong motivation to begin treatment. Different emotional reactions to pain can be distinguished, among them: restlessness, anger, frustration, feelings of helplessness and feelings of depression. The emotions depend on the type of pain. Strong pain can trigger anxiety or even panic attacks. Chronic pain causes sadness and poor mood, which may lead to depression and behavior changes. It may also increase the intensity of pain and worsen a person's health. Chronic pain strongly hinders cognitive processes such as thinking, concentration and feelings of control. Focusing on pain increases sensitivity and strengthens general psychic discomfort.

Chronic pain and anxiety, and the depressed moods or depression that come with them, are bothersome and have a negative influence on existence amongst society. The coexistence of these symptoms limit the functional state and affect physical, mental and social wellbeing. Often the prescribed treatment and subsequent difficulties increase costs without giving any visible progress in therapy. Comorbidity of these conditions is commonly acknowledged, however, there are still debates about the triggering factors and whether a psychological factor (e.g. stress) precedes pain, or it is pain which results from chronic stress. The dependency of the occurrence of feeling depressed may result from disorders of neurochemical transmission. Both conditions reveal the existence of similar disorders created within the area of the same neurotransmitter systems in the form of decreased noradrenergic, serotonergic, cholinergic, dopaminergic and GABAergic activity. They also display irregularities in neuropeptides observed in an excess of substance P and the deficiency of beta-endorphins.

Aim

This research aimed to evaluate the effect of balneotherapy on anxiety, depression, and pain perception level in patients with degenerative joint disease and osteoarthritis of the spine.

Materials and methods

The research group was comprised of 120 patients (79 female and 41 male) suffering from osteoarthritis of the spine and degenerative joint and disc disease.

Their ages ranged from 29-78 years, with a mean age of 54.81. The control group consisted of patients from the Rehabilitation Clinic of Wrocław Health Center "Stablowice". Due to degenerative joint disease and osteoarthritis of the spine the patients were treated on an outpatient basis. The control group comprised 21 subjects (6 males and 15 females) between the ages of 37 to 79 years, mean age equal to 55.5. Both the research and control groups were subject to a pre and post therapy tests.

The research group performed a series of spa treatments assigned to them on the basis of their ailments. They were subject to series of 10 treatments of selected types of therapy depending on their needs and disorders. A series of applied treatments consisted of, for instance: peloid mud and medical radon-sulphide water baths, group and individual healing gymnastics, and laser biostimulation or interferential current therapy.

Extensive therapy consisted of:

- radon-sulphide water baths of the whole body or only upper and/or lower limbs, temperature 37-38°C, duration 20 min,
- peloid mud compresses, temp. 40-42°C, duration 20 min.,
- pool gymnastics in standard water,
- individual gymnastics with sports equipment, and group gymnastics, selected suitably for each patient with regard to their individual fitness level; mean time of physical therapy was 30 – 45 min,
- walking and other outdoor motor activities,
- dry massage –according to the patients' needs was applied to the cervical (C), thoracic (TH) or lumbosacral (LS) parts of spine,
- laser therapy – treatment parameters: sweeping, continuous wave, wave length 808 nm, power 12.0 J, 400 mV, duration 30 s,
- application of low frequency magnetic fields: rectangular shape of impulse, induction 5 mT, frequency 20-50 Hz, duration 20 min,
- ultrasound treatment – treatment parameters: transducer 800 kHz/6 cm², ultrasonic impulse wave 2 ms – impulse, 9 ms interval, dosage 0.5-0.6 W/cm², duration 6 min,
- cryotherapy – vapor, duration 2-3 min, temp. from -80°C to -110°C, duration 2-3 min,
- electrotherapy: diadynamic therapy treatment parameters: DF (1 min), CP (4 min), LP (4 min), interfering Nemec currents (frequency range 0-100 Hz), transcutaneous electrical nervous stimulation (TENS) – electrical impulse of rectangular waveform, impulse duration 0.2 ms., frequency 40 Hz and force from 0 to 100 mA,

- light therapy: infrared radiation from a Sollux lamp equipped with a blue filter, radiation distance 30-40 cm, duration 15 min, polarized radiation, non-coherent Bioptron lamp – radiation distance 10 cm, duration 5-1 min.

Moreover, the patients receiving spa treatment attended meetings with a psychologist and were taught about healthy lifestyle.

The Przręczyn-Zdroj spa played a significant role in the treatment process. Unique on the European scale, it is a place famous for its healing waters. There are radon waters containing sulphur, and their temperature reaches 12°C, pH 7.62. 1 dm³ of water contains 1.96 mg H₂S, 289.6 mg HCO₃⁻, 2.21 nCi Rn (81.8 Bq) and are low mineralization waters.

The control group subjects participated in spa treatment therapy for 10 days. The therapy consisted of: physical therapy, dry massage and physical therapy. These patients did not participate in pool gymnastics, healing baths, outdoor activities, sessions with a psychologist or health education. All led their regular private and professional lives.

The research was approved by the Commission of Bioethics at Wrocław Medical University – opinion no. KB-401/2008. The researchers obtained written consent of the Przręczyn spa President and Director of Wrocław Health Center and individual written consent provided by each patient, prepared according to a template provided by Commission of Bioethics at Wrocław Medical University. All the written consents are in possession of the first author.

In 1983 R.P. Snaith and A.S. Zigmond created a simple, screening test – The Hospital Anxiety and Depression Scale (HADS) – used to determine levels of anxiety and depression. The scale is a practical research tool, and is important to self-evaluation. The efficiency of the scale is based on its clear instruction, touch points and simplicity. The test consists of two independent scales evaluating the level of anxiety and depression. Each scale comprises seven points referring to the patient's current condition. It is the patient who evaluates the intensity level by selecting one of four answers. Scores for each scale are calculated: 0-7 points – normal, 8-10 points – suggestive of the presence of mood disorders, 11-14 points – moderate presence of mood disorders, 15-21 points – abnormal [5, 6, 7]. The Visual Analogue Scale (VAS) is a graphic rating scale used to evaluate levels of pain. The amount of pain felt by a patient is described by a numerical scale from 0 to 10, where 0 means no pain and 10 severe pain. The intensity of pain is the most difficult aspect to examine. Its unbiased evaluation is impossible. VAS is the most frequently used tool to evaluate pain [8, 9, 10].

The results obtained were statistically analyzed with the Polish version of STATISTICA software. Statistical evaluation used $p \leq 0.05$ as the level of significance. Two tests were applied: the sign test and the Wilcoxon signed-rank test. The values obtained pre and post treatment were located on the selected scale and described a matched pair. In the case of statistically significant differences, detailed information regarding the difference (values pre and post) were taken from descriptive statistics (non-parametric tests). Comparisons were conducted as follows: mean values, medians (50.) and percentiles 25. and 75.

Results

Prior to treatment, the mean VAS value for the examined group was 6.13, and after treatment 3.67. Pain reported by the group was described as average, while values obtained by the patients at the end of the treatment indicated only mild pain. Changes observed on the basis of the Wilcoxon test and sign test were statistically significant, equaling $p=0.000$. The mean score for the control group in the corresponding VAS value prior to therapy was 5.76, and post therapy 5. For the same group the Wilcoxon test equaled $p=0$ and in the sign test $p=0.001$. The mean values and descriptive statistics obtained are presented in tables 1 and figure 1.

Table 1. Mean VAS values for research and control groups

VAS – examined group								
	n	mean	SD	min	max	percentile		
						25.	50.	75.
VAS pre- treatment	120	6.13	1.77	0	10.00	6.00	6.00	8.00
VAS post-treatment	120	3.67	1.46	0	8.00	2.00	4.00	4.00

VAS – control group								
	n	mean	SD	min	max	percentile		
						25.	50.	75.
VAS pre- treatment	21	5.76	1.67	3.00	9.00	5.00	6.00	7.00
VAS post-treatment	21	5.00	1.26	3.00	8.00	4.00	5.00	6.00

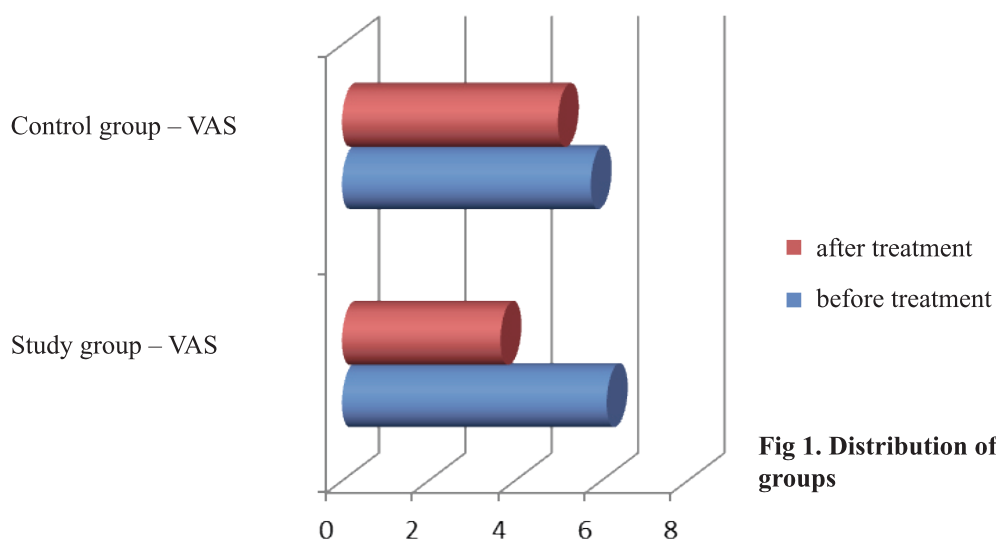


Fig 1. Distribution of mean VAS values for both groups

The research group also displayed changes at the anxiety and depression level. The values of anxiety dropped from 9.27 prior to the treatment to 5.91 after the treatment. Regarding depression, the evaluation showed a decrease in value from 8.07 prior to therapy to 5.29 after. Scoring 8-10 points on each scale was treated as the mild presence of mood disorders. In regard to the anxiety, one could refer to it as a dysfunction which was not observed after the treatment. While in reference to depression, the preliminary evaluation of slightly more than 8 points was insignificant, however, it could indicate possible disorders. After therapy, the patients' conditions improved. Changes in the values obtained by the Wilcoxon test and sign test for both features (anxiety and depression) were statistically significant, equaling $p=0.000$. Changes reported in the control group were less significant. Scores for both preliminary evaluations were normal. Values of the anxiety evaluation prior to treatment were 5.38, while after equaled 4.9. Evaluation of the depression values was 4.9 pre-treatment and 4.67 post-treatment. The anxiety evaluation for the control group by the Wilcoxon test and sign test equaled $p=0.004$, while depression values for both tests were $p=0.063$. Mean values and descriptive statistics are presented in table 2 and figure 2.

Table 2. Mean HADS values for research and control groups

HADS – examined group								
	n	mean	SD	min	max	percentile		
						25.	50.	75.
anxiety evaluation pre-treatment	120	9.27	3.95	1.00	18.00	6.00	9.00	12.00
depression evaluation pre-treatment	120	8.07	3.94	0.00	17.00	5.75	8.00	11.00
anxiety evaluation post- treatment	120	5.91	3.06	0.00	14.00	3.00	6.00	8.00
depression evaluation post- treatment	120	5.29	2.98	0.00	14.00	3.00	5.00	7.00
HADS – control group								
	n	mean	SD	min	max	percentile		
						25.	50.	75.
anxiety evaluation pre-treatment	21	5.38	2.67	1.00	10.00	3.00	5.00	7.00
depression evaluation pre-treatment	21	4.90	2.56	1.00	10.00	3.00	5.00	7.00
anxiety evaluation post- treatment	21	4.90	2.42	1.00	9.00	3.00	5.00	7.00
depression evaluation post- treatment	21	4.67	2.17	1.00	8.00	3.00	5.00	6.50

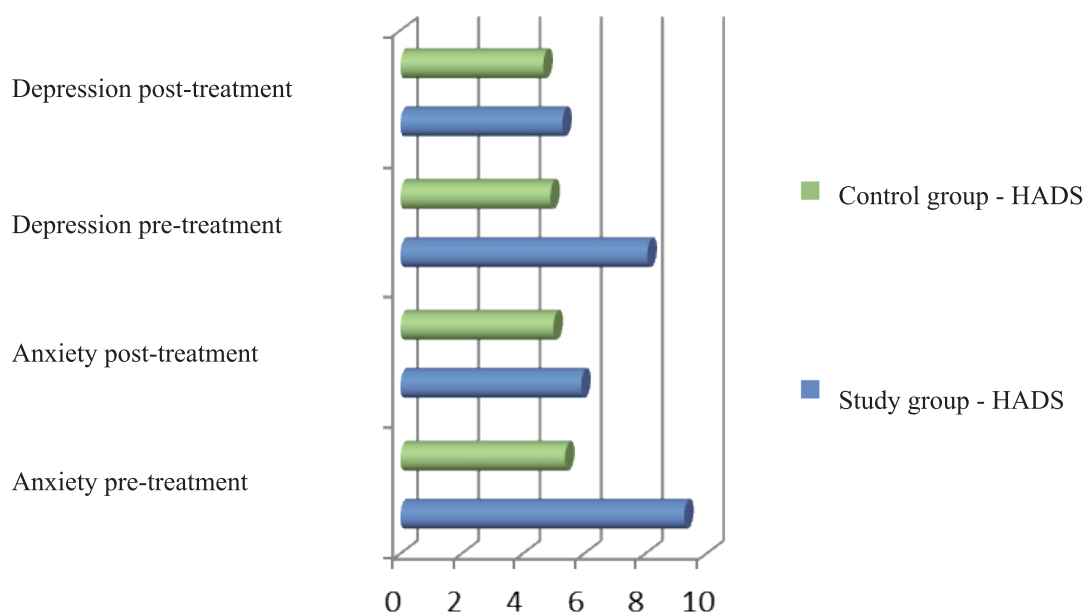


Fig. 2. Distribution of mean HADS values for both groups

Discussion

Research indicates that pain, especially chronic pain, is a physical and mental stress-generating factor which has significant impact on temper and mood [11, 12]. It is also assumed that feelings of depression influence the feeling of pain and its intensity [13].

30 to 80% of patients suffer from depression caused by chronic pain. The figures are confirmed by research conducted in psychiatric clinics and GP surgeries. However, the largest group of patients suffering from chronic pain and depression are those of orthopedic surgeries, and rheumatology and dental clinics. The higher the pain observed in those patients, the more frequent were symptoms of depressed mood or depression. The main reason for pain ailments and emotional disorders is related to motor organ disorders [14, 15, 16, 17, 18]. At the same time we should emphasize the difficulties connected with the identification of atypical depression and appearance of masked depression in the form of chronic pain [19, 20, 21].

HADS is a test adjusted to observe patients suffering from different somatic disorders. Its aim is to evaluate negative emotions occurring in the form of depression and anxiety as part of those disorders. [22] Observation of patients receiving spa treatments in the first test showed slight disorders in the areas of anxiety and depression. After therapy, the mean values of the scores reached a normal level. The control group did not show any anxiety or depression. The values obtained by this group also decreased. The pain evaluation based on VAS enabled the researchers to observe a decrease in pain in

the both groups. Pain decrease was more significant in the case of the patients receiving spa treatments. The reason for this significant improvement may have resulted from a longer therapy period, particularly the extensive healing, balneotherapy, isolation from everyday life, psychotherapy and different forms of relaxation and health education. The group receiving outpatient treatment was not able to participate in all these forms of therapy. The results compared with VAS showed that both treatments were equally efficient in fighting pain, however, spa treatment was more effective. Our own research also has proved the significant efficiency of physiotherapy in treating pain [23, 24].

Research by Talarkowska-Bogusz et al. conducted among patients suffering from osteoarthritis of the spine and degenerative joint disease has proven that low frequency magnetic field therapy and laser biostimulation result in decreased pain ailments in people with feelings of depression and depression. What is more, the decrease of pain in those patients reduced symptoms of depression, but only in its mild and moderate stage [25]. Kwapisz and Głowacka in their research pointed to the decreased level of personal health assessment and satisfaction in 65-81 year old patients, women in particular. Health issues, the feelings of constant pain and limited physical activity are the result of their emotional disorders [26]. Regarding correlations existing between pain, anxiety, depressed mood and brain structures such as neurotransmitters, it seems certain that any therapy should be extensive in the form of drug therapy, psychotherapy and other techniques. Unlike modern "depersonalized medicine," it also seems spa treatments have a lot to offer in this area. Nowadays, there is a great need to look at a person and their health condition and illnesses from a holistic point of view. The spa itself, particularly its location and competent and friendly staff, can be factors toward improving health. A spa meets the criteria of a holistic model of therapy. Regardless of treatment methods, patients have time to relax at a spa, meet people, experience nature and take a break from family and work. They also have the chance to change their eating habits, improve physical fitness and give up addictions [27].

Due to its complexity and extensive nature, spa therapy is highly relaxing and has a great impact on the emotional state of its patients. Frequently factors such as mood improvement and pain decrease are the main benefits of spa treatments. Benefits from contact with nature, loss of ailments, complete recovery and decrease of symptoms of illness may be a source of wellbeing and happiness. This level is frequently impossible to achieve by different therapies [28].



BIEG



01 10 2016

UNIWERSYTETU
MEDYCZNEGO

2016

www.bieg.umed.wroc.pl

Results

1. Spa treatments and outpatient rehabilitation decreased feelings of pain, anxiety and depression in patients suffering from motor organ disorders.
2. Greater efficiency in reducing pain, anxiety and depression was observed in spa treatments.

Adres do korespondencji / Corresponding author

**dr n. med. Krzysztof Aleksandrowicz**

krzysztof.aleksandrowicz@umed.wroc.pl,
tel.: 603613144

Uniwersytet Medyczny im. Piastów Śląskich we Wrocławiu,
Wydział Nauk o Zdrowiu, Katedra Fizjoterapii,
Zakład Lecznictwa Uzdrowiskowego, Historii Medycyny
Fizycznej i Balneologii,
ul. Grunwaldzka 2, 50-355 Wrocław

Piśmiennictwo/ References

1. Chida Y., Hamer M. Chronic psychological factors and acute physiological responses to laboratory-induced stress in healthy populations: a quantitative review of 30 years of investigations. *Psychol. Bull.*, 2008, 134: 829-885
2. Carney R., Freedland K. Depression in patients with coronary heart disease. *Am. J. Med.*, 2008, 121:20-27
3. Jacobson P., Jim H. Psychosocial interventions for anxiety and depression in adult cancer patients: achievements and challenges. *CA Cancer J.Clin.*, 2008,58: 214-230
4. Lustman P., Penckofer S., Clouse R. Recent advances in understanding depression in adults with diabetes. *Curr. Psychiatry Rep.*, 2008, 10: 495-502
5. Rabe-Jabłońska J., Miller A. Związki między bólem a depresją. *Psychiatr. Pol.* 2005; 39,1:7-20
6. Zigmond A., Snaith R.P. The Hospital Anxiety and Depression Scale. *Acta Psychiatr. Scand.*, 1983; 67: 361-370
7. Karakula H., Grzywa A., Śpil A., Baszak J., Gieroba A., Kosikowski W., Jędrych M. Zastosowanie Skali Leku i Depresji – HADS w chorobach psychosomatycznych. *Psych. Pol.* 1996; XXX, 4: 653-668
8. Wordliczek J., Dobrogowski J. Leczenie bólu. PZWL Warszawa 2007
9. Domżał T.M. Ból przewlekły – problemy kliniczne i terapeutyczne. *Pol. Przegl. Neurol.*, 2008; 4, 1: 1-8
10. Domżał T.M. Kliniczne podstawy badania i oceny bólu – wprowadzenie do tematu. *Pol. Przegl. Neurol.* 2007; 3, 4: 211-215
11. Mc Beth J., Macfarlane G.J., Silman A.J. Does chronic predict future psychological distress? *Pain* 2002; 96: 239-245
12. Von Kroff M., Simon G., The relationship between pain and depression. *Br. J. Psychiatry* 1996; 30 (supl.):101-108
13. Rybakowski J., Jaracz J. Depresja a ból: nowe dane kliniczne, neurobiologiczne i psychofarmakologiczne. *Psychiatr. Pol.* 2005; 5:937-950
14. Bair M.J., Robinson R.L., Katon W., Kroenke K. Depression and pain co – morbidity: a literature review. *Arch. Intern. Med.* 2003; 163: 2433-2445
15. Ohayon M.M., Schatzberg A.F. Using chronic pain to predict depressive morbidity in the general population. *Arch. Gen. Psychiatry* 2003;60: 39-47
16. Meana M., Cho R., Desmeules M. Chronic pain: the extra burden on Canadian women. *BMC Womens Health* 2004; (4 supl.1):517
17. Williams L.J., Jacka F.N., Pasco J.A., Dood S., Berk M. Depresja i ból- przegląd piśmiennictwa. *Psychiatria w Praktyce Ogólnolekarskiej* 2006; 2(6): 75-83
18. Kwiatkowska B. Depresja w chorobach reumatycznych. *Terapia* 2003; 11,10:52-54
19. Araszkiewicz A., Piekarska., Drożdż W. Zaburzenia depresyjne i lękowe u pacjentów POZ. *Dyskusje o depresji. Servier*, 2001; 16:2-8
20. Radziwiłowicz P. Depresje jako czynnik wywołujący choroby somatyczne. *Dyskusje o depresji. Servier*, 2001; 17: 8-11
21. Wrodycka B., Chmielewski H., Gruszczyński W., Żytkowski A., Chudzik W. Depresja maskowana (atypowa) u chorych z zespołem bólowym kręgosłupa w praktyce ambulatoryjnej neurologa. *Pol. Merk. Lek.* 2006; XXI, 121:38-40
22. Wasilewski D., Wojnar M., Chatizow J. Depresja a ból: ogólnopolskie badanie epidemiologiczne. *Psychiatria Pol.* 2010; 3(XLIV): 345-445
23. Kuciel-Lewandowska J., Puk K., Paprocka-Borowicz M., Kierzek A., Pozowski A., Józefowski P. Skuteczność wybranych zabiegów fizykalnych u pacjentów z chorobą zwyrodnieniową stawów biodrowych leczonych ambulatoryjnie. *Acta Baln.* 2013;LV, 3(133):170-176
24. Kuciel-Lewandowska J., Paprocka-Borowicz, Jagódzka B., Kierzek A., Pozowski A., Ratajczak B., Boerner E. Ocena skuteczności wybranych zabiegów fizjoterapeutycznych w leczeniu bólu w przebiegu choroby zwyrodnieniowej kręgosłupa szyjnego. *Acta Bio Optica et Inf. Med.*, 2012; 3: 94-199
25. Talarowska-Bogusz M., Florkowski A., Radomska A., Zboralski K., Galecki P. Depresja a ból w przebiegu choroby zwyrodnieniowej kręgosłupa i stawu biodrowego w wieku podeszłym. *Pol. Merk. Lek.* 2006; XXI, 126:566-569
26. Kwapisz U., Głowacka M.. Samoocena zdrowia pacjentów w starszym wieku po leczeniu uzdrowiskowym w badaniach SF-36. *Baln. Pol.*, 2009; 2:140 - 147.
27. Ponikowska I. Ossowski R. Psychoterapia w medycynie uzdrowiskowej. *Baln. Pol.* 2008;4(L): 289-293
28. Łazowski J. Postępy psychopatologii a leczenie uzdrowiskowe. Artykuł nadesłany. www.balneoklinika.com/ptbimf/art_nades1.htm.