Original paper

Functional and biopsychosocial restrictions among patients with a venous ulcer

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Abstract

Introduction: The aim of the study was to assess physical and psychosocial problems of patients with a venous ulcer. Functioning, downfall risk, nutritional status and prevalence of depression were assessed. Relationships between the mentioned variables were also evaluated.
Material and methods: The study was conducted in 2004 and 2005 among 77 patients (mean age 73.9, range 55-92), and included 37 patients from the Venous Ulcers Outpatient Clinic of the Chair and Clinic of Surgery and 40 patients from the Chair and Clinic of Geriatrics, Medical University in Bydgoszcz. A short form of the Tinetti test was used for downfall risk assessment, GDS (Geriatric Depression Scale), Mini Nutritional Assessment (MNA) form and III part of EASY-Care 1997-8 questionnaire were used.
Results: Patients with an ulcer more often had the following problems: depression ($z=5.002$, $p<0.05$), downfall risk ($z=3.43$, $p<0.05$), malnutrition ($z=3.15$, $p<0.05$) and functional disorders ($z=3.37$, $p<0.05$). A higher risk of downfall was observed among patients with functional disorders. The presence of emotional disorders influenced also functioning and nutritional status.
Conclusions: Chronic venous insufficiency and ulcers increase the risk of functional disorders in every sphere of patient's activity – physical, psychological and emotional or social.

Key words: venous ulcer, downfall risk depression, malnutrition, elderly, functioning.

Basic aspects of care among patients with chronic diseases are activities focused on causes of disorders. Practice should be multidirectional and complex, based on holistic diagnosis and include all aspects of the chronic disease. Reductional approach and concentration only on physical disorders predicts negative patient's reactions and leads to non-adaptive mechanisms of coping with the disease.

For this purpose, the patient needs to be treated as a person comprising three elements, not only biological but also psychosocial. It can be seen that the hydrostatic pressure in the venous system, leading to all symptoms of the venous disease and ulcer, is also an indirect cause of general crisis and everyday life difficulties. Every chronic disease, even when it is not life threating, influences physical, psychological, social and emotional spheres of life. Their correlations and feedback reactions make characteristics of the patient which are described in Table I [1-3]. The described disorders are not only consequences and typical features of the senile period. Chronic diseases

Table I. Psychophysical characteristics of patients with chronic venous insufficiency and leg ulcer

Physical aspect	Emotional aspect	Psychosocial aspect
• discomfort – symptoms of chronic venous insufficiency (oedema, heavy legs, pain, paresthesia) • physical restrictions due to wound presence, use of dressings and compression bandages, consequences of inflammatory changes and arthrosis of ankle joint (deformations of joints and bones, muscle atrophy)	• fear connected with the healing process and its effectiveness, bbb lack of safety feeling due to functional restrictions • anger, aggression, frustration – as a reaction to chronic disease • irritation, shame due to wound presence, smell and exudate, esthetic feature of bandages and dressings, which are manifestations of disease • depression – feeling of upset and helpless, in case of not effective and long lasting therapy	• social isolation, avoiding of interpersonal contacts as a fear of shame • fear of other life activities and dependency on other people • self-esteem disorders, feel of being worse than other people

Table II. General characteristics of the study groups

	Patients with ulcers (Venous Ulcer Outpatient Clinic)		Patients without ulcers (Chamber and Clinic of Geriatrics)	
number of patients (general)	77			
	37		40	
number of women (%)	25 (67.57%)		21 (52.50%)	
number of men (%)	12 (32.43%)		19 (47.50%)	
mean age of patients/(Me – median)	73.90±8.51 (Me=75)			
	t=0.187 (NS)			
	70.41±8.23	Me=70	77.13±7.44	Me=77

are only typical features of this age and thus should be systematically treated, causes of restrictions and failures in the patient's activities should be simultaneously repaired [4-7].

The aim of the study was to assess physical and psychosocial problems of patients with venous ulcers. Functional proficiency, downfall risk, nutritional status and prevalence of depression among patients with and without venous ulcers in old age were evaluated.

Moreover, the following correlations were assessed:

1. Prevalence of downfall risk among patients with depression.
2. Prevalence of downfall risk among patients with nutritional disorders.
3. Influence of high downfall risk on functional activities of patients.
4. Influence of emotional state (depression) on functional proficiency.
5. Coexistence of depression and nutritional disorders among elderly patients.
6. Prevalence of nutritional disorders in the aspect of functional proficiency of patients.

Material and methods

The study was performed in 2004 and 2005 among patients with a venous ulcer from the Venous Ulcer Outpatient Clinic of the Chamber and Clinic of Surgery and patients from the Chamber and Clinic of Geriatrics of Medical University in Bydgoszcz. Our study comprised 77 patients (mean age 73.9, range 55-92), including 37 patients from the Venous Ulcer Outpatient Clinic (mean age 70.4, range 55-88) – Group G1.

Forty patients were recruited as a control group (mean age 77.13, range 60-92), without ulcers, hospitalized in the Chamber and Clinic of Geriatrics – Group G2. General characteristics of study groups are shown in Table II.

Methods of diagnostic questionnaire, direct observation and measurement were used in our study. As a measurement tool, the following tools were used: a short form of the Tinetti test [8], part III of EASY-Care 1997-8 questionnaire, the so called Activity of Daily Living (ADL) scale [9], Geriatric Depression Scale (GDS) (Yesavage) (1987) [10] and a short form of Mini Nutritional Assessment (MNA) [11]. The Tinetti test was used for independence degree and downfall risk assessment. Risk was described as: minimal – when the patient was fully independent, medium – among patients who needed technical support, and high – when help from another person was needed. Patients with high

Table III. An analysis of correlations between the number of answers and mean sum of scores obtained in ADL, GDS, Tinetti and MNA test and presence/lack of venous ulcers

Scale	Assessed values	Ulcer	No ulcer	All	U Mann--Whitney test**	Chi² test (r_n)^
		Absolute value (%)				
ADL	0 points	8 (21.6)	15 (38.5)	23 (30.26)	z=3.37 p<0.05	χ^2=2.76 NS (r_n=-0.158)
	>0 points	29 (78.4)	24 (61.5)	53 (69.7)		
	X*±SD	24.86±26.05	5.64±11.7	15±22.1		
GDS	0-10 points	10 (27.03)	33 (86.8)	43 (57.3)	z=5.002 p<0.05	χ^2=4.91 p<0.05 (r_n=-0.6)
	11-20 points	16 (43.2)	4 (10.5)	20 (26.7)		
	21-30 points	11 (29.7)	1 (2.6)	12 (16.0)		
	X* ±SD	15.6±7.3	7.0±5.2	11.24±7.6		
Tinetti	I group#	17 (46.0)	2 (5.0)	19 (24.7)	z=3.43 p<0.05	χ^2=34.8 p<0.05 (r_n=0.428)
	II group##	20 (54.0)	38 (95.0)	58 (75.3)		
	X* ±SD	7.4±9.05	9.75±0.93	8.64±2.48		
MNA	>24 points	13 (35.1)	27 (67.5)	40 (51.9)	z=3.15 p<0.05	χ^2=8.8 p<0.05 (r_n=-0.325)
	17-23,5 points	17 (45.9)	13 (32.5)	30 (38.9)		
	<17 points	7 (18.9)	0 (0)	7 (9.1)		
	X* ±SD	21.38±4.3	24.53±2.8	2301±3.91		

** mean score ± standard deviation*
*** standardized value of normal disposition Z*
 # patients needed physiotherapist referral
patients did not need physiotherapist referral
^ value of consent coefficient (r_n) Ives-Gibbons

risk of downfall during at least one of five exercises or medium risk during two of five exercises were included into the group of patients who need gymnastics and referral to a physiotherapist. The GDS scale served as self-assessment tool and to describe the emotional state of an elderly patient. Patients were divided into three groups due to obtained score – without symptoms of depression (0-10 points), with suspicion of mild depression (11-20 points) and with suspicion of severe depression (21-30 points).

MNA form – anthropometric measurements, general assessment of the patient, diet analysis and subjective assessment of health state – was used to divide patients into three groups due to nutritional state. The following nutritional indicators were used: >24 points good nutritional state, 23.5 – 17 points – risk of malnutrition, <17 points – malnutrition. Proficiency of patients in aspects of basic activities and everyday life was assessed by ADL test evaluating basic spheres of life activities: motion, nutrition, control of physiological functions and hygiene maintaining.

Patients who obtained the minimal score – 0 points – were included into the group of functionally proficient persons in the range of studied activities. Together with an increase of the sum of points the level of patients' proficiency has decreased until the full dependency on other people – the patient obtained the full score of 100 points.

Results were assessed on the basis of statistical methods. Differences in prevalence of individual problems among patients with leg ulcer and without it were assessed by non-parametric Pearson test Chi² (χ^2) – hypothesis of independency of classified quality features was tested. The power of correlation was assessed by accordance coefficient of Ives-Gibbons (r_n) which is characterized by high power. For the purpose of comparing the variables presented in the order scale, the non-parametrical U Mann-Whitney test was used – mean scores from individual tests were compared. Statistical significance U was obtained by standardized Z value. Correlations between tests used in the study were evaluated on the basis of Pearson correlation (r_p). The power of correlation was assessed on the basis of the following assumptions: r_p=0 – no correlation, r_p=0.1-0.3 – weak correlation, r_p=0.31-0.7 – medium correlation, r_p=0.71-0.99 – strong correlation, r_p=1.0 – perfect correlation (exact). Statistical hypotheses were verified at the level of p value <0.05.

Results

Physical and psychosocial problems assessed by the mentioned above tests – ADL, GDS, MNA and Tinetti – more often concerned patients with a venous ulcer. Especially high value of concordance coefficient r_n=-0.6 for GDS scale indicated the high power and correlation between the presence of the

Table IV. An analysis of correlations between individual bio-psycho-social functions tested by ADL, Tinetti, GDS and MNA tests among patients with and without ulcer

Analysed*	Patient's group					
	With an ulcer		Without an ulcer		All	
	Value of correlation coefficient r_p	Significance of correlation – t Student test	Value of correlation coefficient r_p	Significance of correlation – t Student test	Value of correlation coefficient r_p	Significance of correlation – t Student test
1. Tinetti↔GDS	r_p=-0.36	t=-2.283 p<0.05	r_p=-0.148	t=-0.922 NS	r_p=-0.484	t=-4.79 p<0.05
2. Tinetti↔MNA	r_p=0.628	t=4.77 p<0.05	r_p=0.126	t=0.783 NS	r_p=0.606	t=6.596 p<0.05
3. Tinetti↔ADL	r_p=-0.838	t=-9.085 p<0.05	r_p=-0.81	t=-8.531 p<0.05	r_p=-0.863	t=15.756 p<0.05
4. GDS↔ADL	r_p=0.479	t=3.227 p<0.05	r_p=0.275	t=1.763 p<0.05	r_p=0.556	t=5.793 p<0.05
5. GDS↔MNA	r_p=-0.433	t=-2.842 p<0.05	r_p=-0.133	t=-0.827 NS	r_p=-0.482	t=-4.764 p<0.05
6. ADL↔MNA	r_p=-0.732	t=-6.357 p<0.05	r_p=-0.06	t=0.37 NS	r_p=-0.644	t=-7.29 p<0.05
$ADL_{(2)}$↔MNA	r_p=-0.751	t=-6.744 p<0.05	r_p=-0.087	t=-0.54 NS	r_p=-0.602	t=-6.57 p<0.05
$ADL_{(17)}$↔MNA	r_p=-0.571	t=-4.11 p<0.05	r_p=0.117	t=-0.726 NS	r_p=-0.541	t=-5.57 p<0.05

** description of the assessed study problems, 1-6 described in the article text (material and methods)*

ulcer and emotional disorders. Suspicion of light and moderate depression was presented in 72.7% of patients with an ulcer (G1) and only 13.2% of patients without an ulcer. Mean scores of GDS also were significantly different in both groups of patients – mean sum scores in G1 group were twice higher ($z=5.002$, $p<0.05$). Simultaneously patients with chronic venous insufficiency and leg ulcer were significantly less independent during physical activity and had a higher risk of downfall. Patients with an ulcer more often needed specialist referral of the physiotherapist and additional exercises ($\chi^2=34.8$, $r_n=0.428$).

Mean scores in both groups were significantly different ($z=3.43$, $p<0.05$). Patients with ulcers more often needed supplementation and nutritional support due to nutritional deficiencies and poor nutritional state. Nutritional disorders and malnutrition were observed among 64.9% of these patients. Prevalence of the same disorders in G2 group was significantly lower – only 32.5% of patients. Patients without an ulcer had higher independence in everyday life. Complete functional proficiency (ADL test score of 0 points) was observed among 38.5% of patients from G2 group and 21.6% from G1 group. Differences of prevalence proficient/non-proficient patients due to scale parameters were not statistically significant. Nevertheless, mean scores of ADL test were significantly different – more than 20 points higher mean score of end results obtained by patients with an ulcer indicated higher functional disorders (Table III).

The presence of correlations between the studied problems were observed and these problems were significantly more distinctive among patients with an ulcer. A strong correlation was observed in the case of functional proficiency (ADL) and physical proficiency (Tinetti) where coefficient r_p=-0.863. A higher risk of downfall (lower number of points) was observed among patients with higher restrictions of functional and physical proficiency. Similar correlations were observed between functional proficiency and nutritional state. Restrictions, especially connected with meal preparations ($ADL_{(2)}$) and independent consumption ($ADL_{(17)}$) among elderly patients, were correlated with worse nutritional state (r_p=0-0.644). Moreover, among malnourished patients and patients with depression the risk of downfall was higher. Presence of emotional disorders also influenced functional sufficiency and nutritional state (Table IV).

Discussion

Every chronic disease, more or less life threatening and leading to independency restrictions, causes psychological reaction which may appear suddenly at the moment of diagnosis or may gradually increase as a response to disabilities. Coexistent emotional changes, a long lasting feeling of anger and irritation, concerns about the disease increase the risk of depression.

It is believed that every somatic disease may be one of reasons of depression [2, 7, 12, 13]. Diagnosis of depression among elderly patients is most often associated with the presence of circulatory disorders, cancer, diabetes and endocrinological disorders, which is probably associated with specific epidemiology of these diseases and increasing prevalence with age [7, 13, 14]. It is underlined that because of life experiences of elderly patients such as a loss of job, social position, biological disfunctions or death of the spouse may disturb emotional balance and reveal symptoms of preexisting depression. In the literature, prevalence of such disorders in geriatric population is estimated at 2-30% with an increase, even to 45%, in patients with somatic diseases [7, 12, 15]. Gruszeczka et al. [13] and Biercewicz et al. [16] describe undiagnosed symptoms of depression in even a larger group of patients >65 yeas of age – 43.8% of patients from the Chamber and Clinic of Geriatrics of Medical University in Bydgoszcz [16] and in 58.3% of patients from the Chamber and Clinic of Geriatrics of Medical University in Krakow [13]. Mean scores of depression severity in GDS scale in these Clinics were: 5.2 points and 6.4 points, respectively [13, 16], which means that they were lower than results obtained by authors of this study (11.2 points). Suspicion of mild and severe depression diagnosed by GDS scale was presented in 42.7% of all patients including 84.4% of patients with a chronic venous disease and venous ulcer, which suggests a significant impact of disease on psychological functioning of a person. Many authors often describe such associations indicating symptoms of a chronic venous disease as an oedema, trophic changes, pain and malodorous wound exudate as a cause of frustration, anger and shame inducting depression and social isolation of patients with an ulcer [3, 17, 18].

General proficiency of the patient with a chronic venous disease is also disturbed by increasing disfunction of movement and associated inflammatory changes and arthrosis.

Skin changes, lipodermatosclerosis, skin and muscle atrophy or even bones deformations observed in a severe disease restrict the movement of ankle joint and disturb gait statics [19]. They are also a factor intensifying depression and decreasing functional proficiency of patients with an ulcer. Due to changes occurring in bones and muscles they may also need help and/or additional support during walking. Patients feel shame because of their own disability and also often feel fear of being dependent on another person which leads to pathological social isolation [3-5, 18-20].

Avoiding various forms of physical activity leads to an increase of restrictions and disability. Patients with ulcers often signal problems with everyday functioning, walking, shopping, paying the bills, bathing or dressing [21]. These and other functional restrictions or disability to independent everyday living may be only in some degree a result of senile age.

It is worth underlining that the so called functional sufficiency measured by ADL scale parameters was restricted to a higher degree among patients with an ulcer. Mean scores of ADL among these patients estimated in our study were significantly higher than in patients without an ulcer – 24.86 vs 5.64 points, respectively. Studies of other authors interested in functional proficiency of people >65 years of age (without ulcers) confirmed ADL scores in similar ranges, between 5.2 [16] and 9.33 points [21].

Our attention should be focused on the correlation between everyday activity and locomotion activity and mobility [22]. Structural changes in bones and articulations and gait pattern modification are modified by many diseases. They impede not only everyday activity but also make impossible independent moving. The risk of downfall is also increased. In elderly patients population this risk is very high because it concerns 30-40% of patients [23].

In our study a higher risk of downfall was presented among patients with a venous ulcer. Abnormalities of ankle joint structure and function occurred more often in this group.

Coexistence of the described above abnormalities – functional and activity disorders and a high risk of downfall with depression is often a problem of elderly patients. Biercewicz et al. [16] underlined that depression and a high risk of downfall significantly decrease activity of patients.

Gait statics and dynamics disorders may lead to fear of the first or another downfall thus increasing the caution but restricting the activity and physical proficiency. The patient loses hitherto the feeling of safeness. Fear releases contradictory feelings – dread of being active and dread of lack of activity. Coexistent depression manifests itself by somatic and psychomotorical symptoms which decrease life activity [24].

Moreover, depression symptoms include nutritional disorders and weight gain, in our study such symptoms are observed more often among patients with emotional disorders. Despite this correlation further studies are needed to confirm its complex causes because nutritional disorders occurred among patients who were unable to independent meal preparation and/or eating. These patients were less functionally proficient and a majority of them had an active ulcer which is a cause of nutritional loss itself (calories and proteins in wound exudate and used in tissue reparation) [25]. These factors could be both a cause or result of chronic wound. Partially, they could also contribute to an increased use of muscle tissue in metabolic

changes and thus decrease of muscle force. Nevertheless, such processes and changes have multifactorial etiology, they need further studies and exact observations of occurring correlations.

Conclusions

1. Chronic venous insufficiency and leg ulcer significantly increase the risk of functional and activity restrictions in every sphere of everyday life – physical, psychological emotional and social.
2. Depression and downfall risk occurred more often among patients with restricted activity and venous leg ulcer.
3. Elderly patients with chronic venous insufficiency often had coexistent depression, nutritional disorders, restricted functional proficiency and high risk of downfall.

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