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Editor
Academy of Sciences and Arts
of Bosnia and Herzegovina
Bistrik 7
71000 Sarajevo
Bosnia and Herzegovina
www.anubih.ba
Tel. + 387 33 206 034
Fax + 387 33 206 033
amabih@anubih.ba

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Old Jewish drugstore, Oil on canvas, 55x65 cm.
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Burnout and Predictors for Burnout among physicians in Bosnia and Herzegovina- survey and study

Nurka Pranjić

Department of Occupational Medicine, Tuzla University School of Medicine,
Univerzitetska 1, Tuzla,
Bosnia and Herzegovina

Corresponding author:
Nurka Pranjić
University school of Medicine
Department of Occupational Medicine
Univerzitetska 1
75 000 Tuzla, Bosnia and Herzegovina
e-mail: pranicnurka@hotmail.com

High rates of professional burnout syndrome have been found among health service professionals. Our objective was to study the prevalence of burnout syndrome among physicians in Bosnia and Herzegovina and to determine its relationship with environmental factors of the working ambient. A total of 700 physicians in Bosnia and Herzegovina were invited to participate (response rate was 73%, No. of respondents=511). Interviewees were given a specifically designed questionnaire, an Occupational stress questionnaire (OSQ) and the Maslach Burnout Inventory. A high level of emotional exhaustion was detected in 27%, a high level of depersonalization was found in 23%, and reduced personal accomplishment was found in 29% of physicians. There is a significant level of burnout among physicians in Bosnia and Herzegovina, although comparison with other countries is still favorable. Occupational characteristics and social- demographic variables were significant predictors of burnout. Low level of job satisfaction (OR= 2.41, 95% CI=0.29-4.53) and feeling of high level of stress (OR= 2.00, 95% CI=0.08-3.92) were associated with a high level of emotional exhaustion among physician consultants; a feeling of a high level of stress, urgency to get work and "work is mentally strenuous" are risk factors for a higher level of emotional exhaustion among university teaching consultants and general and family medicine practitioners. Personal accomplishment was not related to social demographics and personal factors among clinical specialists and university teaching consultants. Younger age (OR=3.55, 95%CI= 1.19-5.91) and marital status (single versus not single; OR= 1.93, 95% CI=1.06-2.80) are risk factors for emotional exhaustion among general and family medicine practitioners. In view of the results obtained, to reduce professional burnout, the physicians' organizational environment should be improved.

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Key words: Occupational burnout, Physicians, Working ambient, Organizational environmental at work.

Introduction

In occupational health research, topics on work stress have been identified as a priority (1). Indeed, the prevalence of exposure to psychological overload and the corresponding health effects have increased during the past decades and will probably increase even further in the near future (2-3). Burnout and stress- related illnesses among physicians are receiving increased attention (4-7). Burnout as a syndrome is present in many individuals under constant pressure (3).

The burnout syndrome has three dimensions: emotional exhaustion (feelings of being emotionally overextended and exhausted with one's work), depersonalization (development of negative and uncaring attitudes towards others), and negative personal accomplishment (the loss of the competence and dissatisfaction with one's achievements) (3, 8). Too often stress among physicians is left dangerously unmanaged (4).

Burnout is a persistent, negative, work-related state of mind in "normal" individuals, that is primarily characterized by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and development of dysfunctional attitudes and behaviors at work (5). Burnout syndrome includes following three dimensions, i.e., emotional exhaustion, depersonalization in relationships with patients or coworkers and reduced personal accomplishments (6-9). Maslach and Schaufeli used three hypotheses to explain the nature of that syndrome: burnout is associated with decreased job satisfaction, job dissatisfaction is associated with burnout and burnout and job dissatisfaction both may be related to poor working conditions (3, 8). Personal, interpersonal and organizational factors in the working ambient have been reported to relate to stress and burnout (8). Burnout has been associated with impaired job performance and poor health, including headaches, sleep disturbances, irritability, marital dysfunction, fatigue, hypertension, anxiety, depression, myocardial infarction and may contribute to alcoholism and drug addiction (10).

The risk of burnout increases in individuals who consistently experience work overload and a perceived lack of control over the extent to which the load exceeds their capacity (9). Job dissatisfaction and burnout has been documented in several diverse groups of physicians, including general and family practitioners, surgery, infectious disease specialists, anesthesiologists and university teaching consultants (11-14).

This is the first study examining burnout among Bosnia and Herzegovina physicians. We know that rapid organizational change in the health care sector in the post war period (after 1995) in our country (15) has set high adaptation requirements for physicians. Recent changes may be relevant to the growing incidence of stress and burnout among medical specialists. The aim of this study was to explore the prevalence of occupational burnout, and which personal, interpersonal and organizational factors predict burnout among physicians in Bosnia and Herzegovina.

Subjects and method

To test the hypothesis that occupational environmental factors could produce burnout in physicians, a cross-sectional survey was conducted in Bosnia and Herzegovina in 2004 and 2005.

Subjects

A mail survey was conducted among 700 public health care physicians working in Bosnia and Herzegovina, during the spring of 2004. After the first mailing and two reminders, 534 (76%) physicians returned questionnaire. There were 23 (3%) inad-

equately completed questionnaires and 166 of 700 physicians did not respond. Of 511 valid questionnaires (73% response rate), 260 were completed by hospital physicians from University Hospital Center in Tuzla, and the rest by physicians from seven health centers in the Tuzla canton (n=101; all of them general and family practitioners), Brčko district (n=36; all of them general and family practitioners), and Banja Luka region (n=114). There were positive inter-correlations between physicians from the Tuzla canton, Brčko district and Banja Luka region for marital status (P=0.004) but, there was no significant correlation for age and sex. Among the respondents, there were 183 (36%) general and family medicine practitioners, 67 (13%) university teaching consultants, and 261 (51%) specialists. The participation in the study was voluntary.

The study was conducted in accordance with the ethical standards laid down by the Helsinki Declaration (16). The ethical approval for this research was obtained from the appropriate research committee at Tuzla University School of Medicine. Informed consent was obtained from all participants in the study.

Questionnaires

Occupational Stress Questionnaire

We used the abridged form of Occupational Stress Questionnaire (OSQ), translated to the Bosnia and Herzegovina (BH) language, to assess characteristics and perceived working conditions (demands, control over the work, urgency, and distribution of work) and its effects, stress, health, and satisfaction with work and life (17). The OSQ contains four main groups of items as follows: modifying factor (MF), perceived environment (PE), stress and satisfaction with present work and life (SS). The theoretical model of OSQ is based on the psychological stress theory. Occupational stress is examined through perceived stress factors linked with work and the environment, through the individual's stress reactions; and through the organization to influence occupational stress (17). The questionnaire has 13-items, with Likert-type response format. Answers are given on a five point scale (from 1 a bit/a little to 5 very much; or 1 never to 5 always). The Cronbach´s alpha was satisfactory for local context of OSQ (alpha = 0.834), and partly for PE (alpha = 0.781) and for SS (alpha = 0.752). The reliability of the scales of OSQ was in accordance with various other studies (alpha for SS from 0.73 to 0.79; alpha for PE 0.77 to 0.81) (17).

Maslach Burnout Inventory

To measure burnout among physicians we chose the Maslach Burnout Inventory (MBI) for human service survey (18) translated to the BH language to. This questionnaire includes 22 items for a response, scored to on 6-point Likert- type response format: 1, never; 2, rarely 3, sometimes; 4, often; 5, every day, or 1, not at all to 5, very much. The items refer three dimensions: emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA). The psychometric characteristics of the MBI have been assessed in different socio-psychological contexts with quite acceptable results (18-20) with regard to its reliability. The coefficient of Cronbach´s alpha of the internal consistency of the three scales varied between 0.82 and 0.90 for EE; 0.48-0.79 for DP; and 0.57- 0.71 for PA. Cronbach´s alpha was satisfactory for local context in this study for PA (alpha = 0.745), for EE (alpha = 0.902) and for DP (alpha = 0.758). EE scores ≤8 represent a low level of burnout; scores of 9-13 represent moderate level of burnout, and scores of ≥14 high level of burnout. DP scores of ≤2 represent low, scores of 3-8 moderate and scores of ≥10 high level of

burnout. PA scores of ≤33 represent low levels, scores of 31-36 moderate level of PA and burnout and PA scores of ≥27 indicate high level of PA and low level of burnout. These definitions of cut- off scores for PA, EE and DP were used on the basis of results of previous studies by other authors (1, 7, 18).

Statistical analyses

The socio-demographics assessed were sex, age, marital status and job title. Statistical analyses to compare the respondent's socio-demographics were done using $\chi 2$- tests and Student T-tests and One-Way ANOVA for comparisons of groups on the base of age, stress and job satisfaction. Along with the tests, associations between selected MBI variables and socio-demographics and occupational stress of working ambient Spearman correlation coefficients were calculated. To determine the contribution of personal characteristics, job characteristics and perceived working conditions to the prediction of stress and satisfaction, linear regression (LA) analyses were used for 3 domains of variables: EE, PA and DP. Other predictor variables were: high feeling of stress these days, low job satisfaction, possibility to use skilful knowledge at work, urgency to get the work done and work is mentally strenuous; with personal characteristics used as the independent variables. To determine the contribution of personal characteristics, job characteristics and perceived working conditions to the prediction of stress and satisfaction, the dependent variables EE, DP and PA were dichotomized on the base of their cut-off scores e.g. high versus moderate/ low (1 to 3 vs. 4 and 5). Logistic regression analyses were used to identify relevant predictors of EE, DP and PA on the base of predictors calculated odd ratios (OR). All statistical analyses were performed with Statistical Package for Social Sciences (SPSS) 7.5.

Results

Characteristics of survey respondents

Among the 511 physicians included in the analysis, there were 353 (69%) women. The median age of participants was 44 years (range: 28-66). Two hundred and forty-two (47%) physicians were on a full time basis (8-hour daily), 206 (40%) were working on a shift time basis, including night shifts, and 63 physicians worked additional hours (>8 hours). Of 511, 383 (75%) respondents were married or cohabitating. A high level of stress in the workplace was reported by 116 (23%) and "very job satisfied" 274 (54%) by 511 physicians. With respect to mean age, the women, single physicians and general and family practitioners were significantly younger (Table 1).

Generally, the main perceived environmental factors in the working ambient which may relate to burnout were: work is physically strenuous, low level of satisfaction with present life, low lack of control over the work, possibility to use knowledge and skills at work, health status compared with that of people of equal age and unfriendly communication (Table 2). Stress was positively related to job satisfaction ($\rho = 0.460$, $P = 0.001$; data not presented).

Table 3 presents the results of the Maslach burnout inventory scales for the sample as a whole and the sexes separately. The mean burnout scores were: emotional exhaustion 10.0±6.41 (SD), range: 0-24; depersonalization 5.10±4.65 (SD), range: 0-23; and personal accomplishment 38.14±5.60 (SD), range: 16-49; data not showed. Women significantly more often suffered from emotional exhaustion ($\chi 2 = 11.68$; $P=0.030$) and depersonalization ($\chi 2 = 4.74$; $P=0.009$) in relationships to men. Women had higher mean values for emotional exhaustion (EE men = 8.33±6.23 (SD); EE women = 10. 74±0.34 (SD) and higher mean values for the depersonalization (DP men = 4.60±4.14

Table 1. Characteristics of survey respondents (n=511):
age differences for prevalence of sex, marital state, job title, stress and job satisfaction

Personal characteristics of respondentsw	Age (years) Mean ±SD*	No of respondents (%)	P
Gender:			
Men	44.75±9.80	158 (30.92)	
Women	42.70±7.64	353 (69.08)	0.011†
Marital status:			
Single	36.48±7.95	83 (16.24)	
Married or cohabiting	44.11±7.63	383 (74.95)	
Separated or divorced	52.43±4.65	33 (6.46)	
Widowed	53.0±11.78	12 (2.35)	0.001‡
Job title:			
General and family medicine practitioners	38.76±8.16	183 (35.82)	
University physicians consultants	45.88±7.39	67 (13.11)	
Physicians- specialists	45.93±7.63	261 (51.07)	0.001‡
Stress at work:			
No stress at all	44.15±8.99	89 (17.4)	
Rarely	41.50±8.27	152 (29.7)	
Sometimes	43.15±8.89	154 (30.2)	
Stressful	45.33±6.43	69 (13.5)	
Very stressful	45.40±7.69	47 (9.2)	0.001‡
Job satisfaction:			
Very satisfied	43.98±8.06	53 (10.4)	
Satisfied	42.79±9.23	221 (43.2)	
Sometimes	43.75±7.18	171 (33.5)	
Rarely	43.49±8.32	43 (8.4)	
Not satisfied at all	44.65±9.93	23 (4.5)	0.033‡

* SD – standard deviation; † Student T- test; ‡ ANOVA – One way

Table 2. Means and standard deviation for the subscales of OSQ in Bosnia and Herzegovina physicians (n=511)

Scales/sub-scale	Mean ±SD*		
	Men (n= 158)	Women (n=353)	P†
Modified factors (MF):			
Can you influence matters concerning you at work?	2.91±0.84	3.10±0.74	0.051
Does your superior provide help and support when needed?	2.89±1.23	2.90±1.10	0.484
How do colleagues get along at your workplace?	2.67±1.16	2.29±1.15	0.001
In your close circle at the working place, is there someone you openly discuss personal matters and problems with?	1.75±0.73	1.82±0.73	0.909
Perceived environment (PE):			
Do you have to hurry to get your work done?	3.05±0.96	3.20±0.94	0.135
Does your work have phases that are too difficult?	2.69±1.09	2.82±0.91	0.105
Can you use your knowledge and skills in your work?	2.03±0.94	2.29±1.00	0.002
Is your work mentally strenuous?	3.65±1.19	3.58±1.14	0.417
Is your work physically strenuous?	2.99±1.20	2.75±1.20	0.034
Stress and satisfaction with present work and life (SS):			
Do you feel stress these days?	2.54±1.22	2.73±1.16	0.110
How satisfied are you with your present work?	2.41±0.94	2.59±0.95	0.421
How satisfied are you with your present life?	2.29±0.95	2.33±0.91	0.022
What is your health state compared with that of people of your age?	1.96±0.80	2.34±0.89	0.001

*A score (mean score) of 2.2 is considered high; †χ^2 test

(SD); DP women= 5.32±4.85 (SD) (data not presented). Our sample shows that 64% of the respondents suffered from emotional exhaustion 35% high level and 30% moderate level. Depersonalization was present among 64% of the respondents, 15% high level and 49% moderate level and 249 (48.7%) moderate level). Lack of personal accomplishment was found among 37% of the respondents; 29% moderate level and 8% low level:. Comparison of various levels of MBI subscales between male and female physicians indicated that women have a significantly higher level of emotional exhaustion and also a low level of emotional exhaustion (Table 3).

When personal accomplishment, emotional exhaustion and depersonalization are entered as dependent variables, in three multiple regression analyses in a hierarchical approach, the results provided a selection of predictors out of the selected pool of potential factors. In this way (presented in table 4), the results found in the second step that the only predictor for decrease of personal accomplishment was marital status (β2=-1.022; P= 0.01). Although, the high level of emotional exhaustion was significantly predicted with work: is mentally strenuous (first and second step), low level of support from superior (first step), high level of stress (first and second step), sex (second step), marital status (second step), significant effect being university teaching consultants compared to family and general medicine practitioners (dummy 1) and significant effect being physician specialists compared to family and general medicine practitioners (dummy 2). Predictors with the highest contribution for a high level of depersonalization were low lack of control over work, the possibility to use knowledge and skills at work and a high level of stress (all in first and second step), work is mentally strenuous (second step), age (second step), a significant effect being university teaching consultants compared to family and general medicine practitioners (dummy 1) and a significant effect being physician specialist compared to family and general medicine practitioners (dummy 2) (Table 4).

Low level of personal accomplishment was associated with age (younger versus older physicians of total sample). The main predictors of emotional exhaustion among university teaching consultants were: high feeling of stress these days, urgency to get the work done, possibility to use skillful knowledge at work and low level of job satisfaction. Depersonalization was also significantly associated with feeling that work is mentally strenuous and a high level of stress. Socio-demographics factors did not influence MBI subscales among university teaching consultants. General and family practitioners suffered emotional exhaustion when work is mentally strenuous, when they have to hurry to get the work and when they were distressed. Low level of personal accomplishment and high level of depersonalization among family and general practitioners were associated with a high level of stress and feeling that work is mentally strenuous. Physician specialists suffered emotional exhaustion when they have low level of job satisfaction and a high level of stress and a high level of depersonalization was only associated with low level of job satisfaction. General and family medicine practitioners who are single expressed most often depersonalization (Table 5).

Discussion

In this study of Bosnia and Herzegovina physicians, twenty seven percent presented a high level of emotional exhaustion, twenty two percent a high level of depersonalization and twenty nine percent a low level of personal accomplishment. Among the Bosnia and Herzegovina sample, the mean score for the personal accomplishment subscale was 38.1±5.6. The comparison of the distribu-

Table 3. Assessments of level of three dimensions of burnout between male and female physicians (n=511)

Dimension of MBI	No. of respondents (%)			
	Men (n= 158)	Women (n=353)	Total (n=511)	P*
Personal accomplishment (PA):				
High level	102 (64.6)	221 (62.6)	323 (63.2)	0.105
Moderate level	45 (28.5)	102 (28.9)	147 (28.8)	0.211
Low level	11 (6.9)	30 (8.5)	41 (8.0)	0.063
Emotional exhaustion (EE):				
High level	39 (24.7)	134 (38.0)	173 (34.8)	0.040
Moderate level	44 (27.8)	102 (28.9)	146 (29.6)	0.268
Low level	75 (47.5)	117 (33.1)	192 (35.6)	0.040
Depersonalization (DP):				
High level	16 (10.1)	62 (17.6)	78 (15.3)	0.378
Moderate level	83 (52.6)	166 (47.0)	249 (48.7)	0.231
Low level	59 (37.3)	125 (35.4)	184 (36.0)	0.272

*χ^2 test

Table 4. Predictors of subscales of Maslach Burnout Inventory among 511 physicians

	PA´		EE´		DP´	
	$\Delta R1^2$	$\Delta R2^2$	$\Delta R1^2$	$\Delta R2^2$	$\Delta R1^2$	$\Delta R2^2$
	0.031	0.052	0.138	0.205	0.087	0.118
Personal factors	β1	β2	β1	β2	β1	β2
Do you have any influence on matters at work, which concern you?	-0.59	-0.59	0.08	0.25	-0.92*	-0.90*
Is your superior providing help and support when needed?	-0.04	-0.02	-0.64*	-0.51	-0.64	-0.58
Is there anyone else who you can openly discuss personal matters and problem with?	0.93	0.89	0.34	0.56	-0.02	0.01
Do you feel stress these days?	-0.19	-0.25	-1.4**	-1.4**	-0.81*	-0.78*
Is your work mentally strenuous?	-0.69	-0.63	0.92**	1.07**	-0.58	-0.64*
How do colleagues get along at your workplace?	-0.01	-0.02	0.19*	0.26*	-0.01	-0.01
Can you use knowledge and skills in your work?	0.39	0.45	-0.42	-0.39	-1.17*	-1.20*
Do you have to hurry to get your work done?	-0.17	-0.13	-0.19	-0.44	-0.07	0.01
Does your work have phases that are too difficult?	0.66	0.53	0.17	0.39	-0.39	-0.41
Are you satisfied with your present work?	0.78	0.91	0.38	0.54	-0.64	-0.71
Socio demographics						
Age		0.40		-0.13		-0.59*
Marital status		-1.02*		0.32		-0.10
Sex		0.12		1.06**		-0.04
University teaching consultants		0.42		1.07**		0.94**
Physician specialist		-0.36		0.59**		0.47**

*P<0.05; ** P<0.001; PA: Personal accomplishment, EE: Emotional exhaustion and DP: Depersonalization; $\Delta R1^2$ and β1 refer to estimates from the first step of the regression analyses: only personal factors; $\Delta R2^2$ and β2 refer to estimates from the second step of the regression analyses: personal factors + socio- demographics only personal factors

tion of the three subscale scores of the MBI with other studies conducted among medical doctors in America and European Union countries showed that Bosnia and Herzegovina physicians suffered lower mean emotional exhaustion and depersonalization and have a higher personal accomplishment score (Table 6) (7, 18, 22, 23, 25, 26).

A study of personal factors that predict burnout among physicians examined three factors: perceived work demands, social support from superior and colleagues, and

Table 5. Factors associated with a higher risk to report burnout among 511 Bosnia and Herzegovina physicians

Predictor variables	PA´		EE´		DP´	
	OR	95%CI	OR	95%CI	OR	95%CI
Total sample						
Single versus not single	0.13	(-0.36- 0.61)	-1.87	(-5.84- 2.09)	-1.42	(-4.24- 1.38)
Younger versus older than 45 years	0.98	(0.32- 1.64)*	-0.42	(-2.63- 1.78)	0.82	(-1.64- 2.04)
University teaching consultants						
High feeling of stress these days	-0.39	(-1.07-0.27)	1.57	(0.94- 2.19)**	1.11	(0.54- 1.69)
Possibility to use knowledge at work	-0.22	(-1.08-0.64)	-0.87	(-1.68—0.07)*	0.283	(-0.45- 1.02)
Urgency to get work done	-0.38	(1.17- 0.41)	1.30	(0.56- 2.05)**	-0.37	(-1.05- 0.30)
Work is mentally strenuous	-2.5E-02	(-0.75-0.70)	0.32	(-0.36- 1.01)	0.76	(0.14- 1.39)*
Low level of job satisfaction	0.8E-03	(-0.90- 0.88)	2.21	(1.36- 3.051)**	0.35	(-0.42- 1.14)
Single versus not single	0.26	(-0.53- 1,05)	0.24	(-0.67- 1.18)	-4.9E-03	(-0.73-0.72)
Younger versus older than 45 years	0.48	(-0.92-1.88)	-0.23	(-1.91-1.45)	0.42	(-0.89- 1.72)
General and family medicine practitioners						
High feeling of stress these days	-1.31	(2.21- 0.41)**	2.15	(1.26- 3.03)**	0.78	(0.22- 1.33)**
Possibility to use knowledge at work	0.45	(-0.63- 1.54)	0.43	(-0.62- 1.50)	0.17	(-0.49- 0.84)
Urgency to get work done	-0.29	(-1.49- 0.92)	-1.54	(-2.72- -0.35)*	-0.61	(-1.36- 0.12)
Work is mentally strenuous	1.28	(0.39- 2.16)**	1.64	(0.76- 2.50)**	0.95	(0.40- 1.49)**
Low level of job satisfaction	-0.48	(-1.66- 0.71)	4.1 E-02	(-1.11- 1.20)	8.8 E-02	(-0.64- 0.82)
Single versus not single	-0.64	(-1.48- 0.20)	1.93	(1.06-2.80)**	0.96	(0.44- 1.49)**
Younger versus older than 45 years	2.30	(0.04- 4.52)*	3.55	(1.19- 5.91)**	1.29	(-0.13-2.71)
Physicians specialists						
High feeling of stress these days	-0.18	(-2.18- 1.82)	2.00	(0.08- 3.92)*	3.1E-02	(-1.63- 1.69)
Possibility to use knowledge at work	-0.94	(-3.06- 1.18)	-1.42	(-3.75- 0.62)	-1.29	(-3.04- 0.47)
Urgency to get work done	1.27	(-1.35- 3.90)	0.51	(-2.01- 3.04)	1.24	(-0.94- 3.42)
Work is mentally strenuous	-0.80	(-2.28- 0.67)	0.31	(-1.09- 1.73)	-0.139	(-1.36- 1.08)
Low level of job satisfaction	1.67	(-0.53- 3.87)*	2. 41	(0.29- 4.53)*	2.55	0.73- 4.38)**
Single versus not single	1.45	(0.56- 2.33)**	1.35	(0.35- 2.36)**	0.66	(-0.18- 1.50)
Younger versus older than 45 years	0.58	(-2.30-3.56)	-2.96	(-6.18-0.25)**	-2.80	(-5.37- 0.24)*

*P<0.05; ** P<0.001; PA: Personal accomplishment, EE: Emotional exhaustion and DP: Depersonalization

Table 6. Distribution of the three subscale scores of the Maslach Burnout Inventory among physicians in different countries

Physicaus in different countries	High level of EE (%)	High level of DP (%)	Low level of PA (%)
Bosnia and Herzegovina physicians (n= 512)	27	23	29
American general medicine residents (n= 115) (7)	53	64	31
British gastroenterologist (n=241) (22)	31	28	38
British surgeons (n=161) (22)	27	19	32
British oncologists (n=266) (22)	35	27	37
British radiologist (n=214) (22)	33	21	49
Italian general practitioners (n=182) (23)	32	27	13
Italian hospital- based practitioners (n=146) (23)	22	23	14
Swiss primary care practitioners (n= 1755) (27)	19	22	16
	Mean EE*	Mean DP†	Mean PA‡
Bosnia and Herzegovina physicians (n= 512)	10.0	5.10	38.1
Dutch medical specialists (n=2400) (26)	15. 5	7. 4	27. 3
Swiss primary care practitioners (n= 1755) (27)	17.9	6.5	39.6
American general medicine residents (n= 115) (7)	26.4	12.7	36.2
Italian general practitioners (n=182) (23)	18. 5	6.1	38.5
British general practitioners (n=245) (22)	26.1	9.8	32.7

PA: Personal accomplishment, EE: Emotional exhaustion and DP: Depersonalization; *high emotional exhaustion is defined as an emotional exhaustion subscale score ≥14, high depersonalization (high cynicism) subscale scores ≥10, and low level of personal accomplishment (low efficacy) ≤33 (1)

job satisfaction. All three predictors were related to age and specialty (17, 19). In Bosnia and Herzegovina the group of the physicians' professional characteristics and socio- demographic variables were significant predictors of burnout. A large portion of the variation of the emotional exhaustion scale was associated with qualifications to relation of amount of working activity. The risk profile obtained suggests that to have a position of high responsibility and to be female are risk factors for higher levels of emotional exhaustion, to have a position of high responsibility and to be younger are risk factors for higher levels of depersonalization, whereas to be single is only a risk factor for lower levels of personal accomplishment. Results of this study prove partially the statement that personal accomplishment is not related to personal and occupational characteristics, or with job satisfaction evaluated by others (8, 25-27, 28).

The different personal factors: high feeling of stress, interpersonal relation between colleagues and work is mentally strenuous predicted a high level of emotional exhaustion among Bosnia and Herzegovina physicians. The prevalence of burnout increased significantly together with increased perception of the importance of relations among colleagues and superior, which has already been reported (21, 29). A high feeling of stress, the urgency to get work done, the possibility to use knowledge at work and a perceived loss of control over the working ambient accounted for a significant portion of depersonalization scores. The biggest contributor to burnout is sheer workload (work is mentally strenuous, urgency to get the work done) and perceived loss of control over the working ambient (30). "Perceived control" was based on the ability to influence the work environment or the opportunity to participate in decision-making (influence on matters at work concerning oneself), the degree to which lack of autonomy contributes to feelings of stress, and satisfaction with control over schedule (30). Perceived control over the working ambient was also an important predictor of physician burnout in the present study too. Physicians with less perceived control, greater stress from uncertainty, higher job demands, and fewer social supports were at greater risk for burnout.

The findings of this study showed a minimal relation between age and level of stress and satisfaction. Female physicians were reported more likely than male to have high level of work related stress and burnout. Women more often than males manage domestic responsibility and if they have children, balance the role of mother with carrier demands (28).

Changes in medical care systems can act as stressors on the medical occupation (26). A physician's career for at least a decade needs large amounts of knowledge and experience. For this reason, high expectations and heavy work demands, levels of expectation and work demands may prove excessive, causing extreme mental and physical exhaustion and contributing to burnout (27, 16). The results of this study prove this statement only for teaching consultants and general and family practitioners. They have continued medical education in the framework of reforms of medical care over the past decade but not related to other physician consultants. The highest risk of burnout was among general and family practitioners who are single versus married and who are younger versus older than 45 years, and may well reflect the influences of: high feeling of stress, urgency to get work done and work is mentally strenuous. Burnout scores were higher for younger physicians when compared with physicians in the two middle aged categories. This result is in accordance with the results of Deckard at al., where older physicians (>48 years of age) had higher mean satisfaction than younger physicians (13).

On other hand, long-term unsatisfactory working conditions result in a negative self-

perception of one's health and work ability and in a complete loss of interest in remaining in the medical profession (29), which are characteristic for clinical specialists in this study. For instance, burnout seems to be less prevalent among older people (8).

Burnout is more common among university teaching consultants and among general-family practitioners (emotional exhaustion and depersonalization). We found that when stress related work was high, job satisfaction was inversely high among general and family medicine practitioners. A high feeling of stress, a low level of possibility to use knowledge at work and a feeling of low satisfaction were associated with emotional exhaustion among university teaching consultants.

The best prevention for burnout among physicians is to promote their personal and professional well-being on all levels - physical, emotional, psychological and spiritual. Factors internal to the organization, such as styles of leadership and management, administrative policies and procedures, and organizational culture have a powerful effect on physicians' well-being (27, 28).

An important limitation of our study was the possibility of generalization of our findings, as health systems differ between countries. The main limitation is its cross-sectional nature, which precludes evaluation of temporality and causality of the observed relationships. Another limitation is assessment based on self-reported rating scales which raises the issue of measurement error. On other hand the participation rate was excellent (73%) given that studies among physicians rarely exceed 50%.

Conclusions

The key findings of our study were that the prevalence of burnout among Bosnia and Herzegovina physicians was not as high as among US and Dutch physicians, but was in line with other Europe countries. General and family practitioners and university teaching consultants are at the highest risk for burnout. Health care organizations have a vital interest in preventing physician burnout. (30-39) Physician well- being is associated with occupational accomplishment, patient satisfaction and patient safety (30, 31) Physicians should have a hand in work design and practice management. A physicians' health committee should review corporate decisions and contracts for their impact on physicians (38, 39). Organizational efforts aimed at increasing the level of job satisfaction among physicians could help to prevent burnout. Intervention programs in health care organizations to prevent stress in the workplace and promotion of staff and patient health should be implemented.

Acknowledgements

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Incidence of childhood acute lymphoblast leukemia in the Federation of Bosnia and Herzegovina

Meliha Sakić[1], Jasmina Berbić-Fazlagić[2]

[1]Pediatric Clinic, Clinical Centre, University of Sarajevo, Bolnička 25, Sarajevo, Bosnia and Herzegovina
[2]Clinic of Hematology, Clinical Centre, University of Sarajevo, Bolnička 25, Sarajevo, Bosnia and Herzegovina

Corresponding author:
Meliha Sakić
Pediatric Clinic, Clinical Centre, University of Sarajevo, Bolnička 25, 71000 Sarajevo, Bosnia and Herzegovina
e-mail: meliha.sakic@yahoo.com

The aim of this paper was to investigate the incidence of acute lymhoblast leukemia (ALL) among children aged 0 to 15 years in the Federation of Bosnia and Herzegovina in the period from 1997 to 2004. The data for this paper were obtained by retrospective analysis of 139 case histories of children who were treated at the Haematology-Oncology Department of the Pediatrics Clinic of University Clinic Centre in Sarajevo in the period from 1 January, 1997 to 31 December, 2004 but also by analysis of the data provided by Cantonal health institutions in the Federation of Bosnia and Herzegovina. The above indicated data were complemented by those of the children who had been sent for treatment to the Clinic-Hospital Centre "Šalata" in Zagreb and the Clinic Centre in Split (the Republic of Croatia) at their parents' request. The data on population samples were taken from the yearly statistical reports of the Federal Statistical Institute. In the area of the Federation of Bosnia and Herzegovina it was recorded that 119 children (83 boys (69,7%) and 36 girls (30,3%) suffered with ALL in the period from 1 January, 1997 to 31 December, 2004.The total ALL incidence rate in children of either sex in the observed period was 3.2/100.000 (95%CI 2.6-3.8). In Posavina Canton the incidence rate was highest, amounting to 6.4/100.000 (95%CI 1.7-16.4), while in Herzeg Bosnia Canton the rate was lowest and it amounted to 0.77/100.000 (95%CI 0.7-4.3). In other Cantons the incidence rate was fairly uniform. Poisson regression indicates that the rates do not differ significantly between the cantons (likelihood ratio χ^2 test =14.88, df=9, P=0.09). The results of our investigation indicate that the average incidence rate of ALL in the area of Federation of B&H, in comparison with similar studies conducted in other countries, does not show statistically significant differences.

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Key words: Acute lymphoblast leukemia, Children, Federation of Bosnia and Herzegovina.

Introduction

Acute lymphoblast leukemia (ALL) occurs when a genome undergoes transformation within a matrix hematopoetic cell. Due to the process of cell division the new cells are produced with the identical biological properties of the initial cell. The clonal population shows advantage in respect of growth and, thus, it suppresses the healthy population. These clonal cells cause the clinically recognizable disease (1, 2). The exact cause of ALL disease is not known but the unfavourable living environment (such as bad socioeconomic conditions, infections, radiation etc.) may play a significant role in provoking this disease (3).

The ALL incidence in the U.S.A. is 3 to 4 cases among 100,000 children below the age of 15 (4), while this rate is highest among children in the 3-5- year-old age group (4). In the overcrowded urban areas a slightly higher incidence rate was recorded.

In the past 20 years an increase in the childhood ALL incidence has been recorded worldwide (4). However, over the past years, thanks to significant achievements in diagnostics and therapy treatment, a high survival rate among ALL sufferers has been recorded.This refers in particular to the sufferers in the 5-9-year-old age group wherein the survival rate exceeds 80% (4).

Thanks to clinical obseravtions and medical documentation of the Pediatrics Clinic of Sarajevo University Clinic Centre an increase in the number of childhood ALL sufferers in the Federation of Bosnia and Herzegovina who underwent treatment in the post-war period was noticed. However, the accurate incidence rate in the said area was not investigated.

Hence, the aim of the present paper was to investigate the ALL incidence rate among children in the 0-15-year-old age group in the area of the Federation of B&H in the 1997-2004 period.

Patients and Methods

Area of research

Bosnia and Herzegovina is a southern European country bordering with Croatia, Serbia and Montenegro. It consists of two administrative units: Federation of B&H and Republika Srpska. The Federation of B&H is composed of ten cantons:Una Sana, Posavina, Tuzla, Zenica Doboj, Bosnia Podrinje, Central Bosnia, Herzegovina Neretva, West Herzegovina, Sarajevo and Herceg Bosnia (Figure 1).

Subjects and Methods

Data for the present study were obtained by retrospective analysis of 119 case histories of children who were treated at the Haematology-Oncology Department of the Pediatrics Clinic of Sarajevo University Clinic Centre in the period from 1 January, 1997 to 31 December, 2004 and by analysis of the data obtained from the respective cantonal health institutions in the Federation of B&H. The above indicated data were complemeted by those of the childhood ALL sufferers from

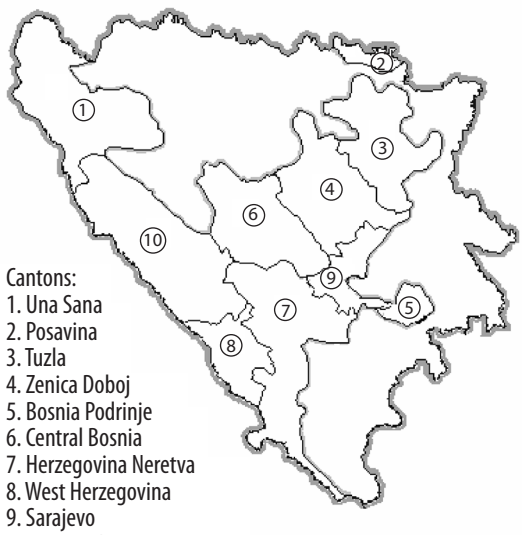

Fig. 1. Map of cantons in the Federation of Bosnia and Herzegovina

the area of the Federation of B&H who were treated at the Clinic-Hospital Centre „Šalata" in Zagreb and the Clinic Centre in Split, respectively, both located in the Republic of Croatia. The population sample data were obtained from the yearly statistical reports of the Federal Statistical Institute (5).

Statistical analysis

Total incidence rate and incidence rates referring to particular cantons within the Federation of B&H but also in respect of age were calculated as the number of ALL patients among 100, 000 children in the 0-15-year-old age group.

Results

In the area of the Federation of B&H 119 children (83 boys (69.7%) and 36 girls (30.3%)) suffered with ALL in the period of 1 January, 1997 to 31 December, 2004.

Table 1 shows the number of ALL patients in the cantons of the Federation of B&H in respect of the patients' sex.

The highest number of childhood patients were recorded in Tuzla Canton (23,5%), followed by Sarajevo Canton (21,0%) and Zenica Doboj Canton (15,9%), respectively.

By analysing the total number of childhood patients in the Federation of B&H in the 1997-2004 period a significantly higher number was observed in the year 2002 while the lowest number was recorded in the year 2004; in other years within the observed time period this number was fairly uniform (Figure 2).

Distribution of childhood ALL patients in respect of age is shown in Table 2. The highest number of patients was recorded in the 2-5-year-old age group and 7-8-year-old age group, respectively, while in other age groups the number was significantly lower.

The ALL incidence among children in the 0-15-year-old age group in the 1997-2004 period in the FB&H is shown in Table 3. The total ALL incidence in the observed period among children of either sex was 3.2/100.000 (95%CI 2.6-3.8). In Posavina Canton the incidence rate was highest, amounting to 6.4/100.000 (95%CI 1.7-16.4), while in Herceg Bosnia Canton it was lowest, amounting to 0.77/100.000 (95%CI 0.7-4.3). In other cantons the incidence rate was fairly uniform. Poisson regression indicates that the rates do not differ significantly between the cantons (likelihood ratio χ^2 test =14.88, df=9, P=0.09).

Table 1. Number of childhood ALL patients in respect of sex in cantons of FB&H* in 1997- 2004 period

Canton	Sex				Total	
	Male		Female			
	n	%	n	%	n	%
Una Sana	5	6.0	4	11.1	9	7.6
Posavina	3	3.6	1	2.8	4	3.4
Tuzla	22	26.5	6	16.7	28	23.5
Zenica Doboj	12	14.5	7	19.4	19	15.9
Bosnia Podrinje	1	1.2	-	-	1	0.8
Central Bosnia	15	18.1	1	2.8	16	13.5
Herzegovina Neretva	6	7.2	8	22.2	14	11.8
West Herzegovina	1	1.2	1	2.8	2	1.7
Sarajevo	17	20.5	8	22.2	25	21.0
Herceg Bosnia	1	1.2	-	-	1	0.8
Total FB&H	83	100.0	36	100.0	119	100.0

*FB&H: Federation of Bosnia and Herzegovina

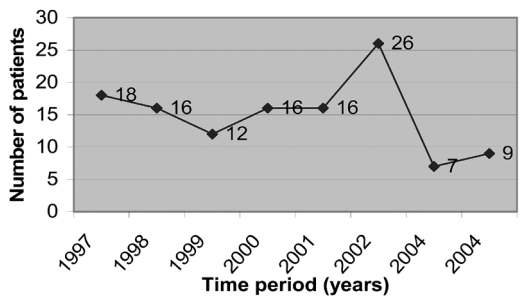

Figure 2. Distribution of Childhood ALL patients in relation to the time period observed in the study

Table 2. Distribution of childhood ALL patients in respect of age in the Federation of Bosnia and Herzegovina

Sex	Distribution of children suffering with acute lymhoblast leukemia in respect of age (years)														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Male	3	6	11	10	10	2	10	10	5	2	3	5	2	4	83
Female	1	2	4	7	2	5	4	3	1	3	1	2	1	-	36
Total	4	8	15	17	12	7	14	13	6	5	4	7	3	4	119

Table 3. Incidence of acute lymphoblast leukemia among children in the 0-15-year-old age group in the 1997-2004 period

Canton	ALL* (n)	Population	Incidence rate (95% CI)
Una Sana	9	525.023	1.7 (0.8-3.2)
Posavina	4	62.197	6.4 (1.7-16.4)
Tuzla	28	839.710	3.3 (2.2-4.8)
Zenica Doboj	19	568.693	3.3 (2.0-5.2)
Bosnia Podrinje	1	54.502	1.8 (0.05-10.2)
Central Bosnia	16	439.414	3.6 (2.0-5.9)
Herzegovina Neretva	14	329.663	4.2 (2.3-7.1)
West Herzegovina	2	135.437	1.5 (0.02-5.3)
Sarajevo	25	570.799	4,4 (2.8-6.4)
Herceg Bosnia	1	129.560	0.77 (0.7-4.3)
Total FB&H	119	3.654.998	3.2 (2.6-3.8)

*ALL: acute lymphoblast leukemia

Discussion

The results of our research show that the total ALL incidence rate among children of either sex from the area of the Federation of B&H in the observed period was 3.2/100.000 (95%CI 2.6-3.8) and it is slightly lower in comparison with the results of the twenty-year researches conducted in Sweden, Germany, Norway, Finland and Iceland where the the ALL incidence rate ranged from 3,8/100.000 to 4/100.000 (6). However, the ALL incidence rate in our research was higher in relation to the total incidence rate of 2,6/100.000 referring to Jerusalem (7) where the legal registration of children suffering from leukemia and related malignant diseases has been carried out since 1982. The increased incidence of leukemia patients was observed in north-western Italy (8) where since 1967 the Childhood Cancer Registry has recorded the annual increase of 2,6% among children suffering with ALL in the 1- 4-year-old age group while no increase in other age groups has been recorded. In our research a significantly higher incidence rate among children suffering with ALL could be related to a deteriorating socio-economic status of parents at the time of inception of sick children (3).

The results of our research show that the average ALL incidence rate obtained in the area of the Federation of B&H does not differ significantly in comparison with similar studies conducted in other countries.

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Unipolar, Bipolar or Total Hip Endoprosthesis after Femoral Neck Fracture: What is a Right Decision?

Dragica Smrke[1], Mirza Biščević[2]

[1]Department of Traumatology,
Clinical Center- Ljubljana, Slovenia,
[2]Department of Orthopedics and Traumatology,
Clinical Center-Sarajevo, Bosnia and Herzegovina.

Corresponding author:
Mirza Biščević
M. Mikulića 25
71000 Sarajevo, Bosnia and Herzegovina
e-mail: mirzabiscevic@hotmail.com

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The aim of this study was to recognize differences in mid-term clinical outcome after femoral neck fracture and hip endoprosthesis implantation. A total of 145 patients were examined, 32 patients with unipolar, 70 with bipolar and 43 patients with total hip endoprosthesis. The mean values of Harris Hip Score, after 3.8 ± 1.9 years, were: 72.1 ± 17.8, 74.27 ± 19.1, 78.2 ± 22.5 for patients with unipolar, bipolar and total hip endoprosthesis, respectively. No statistically significant difference was observed (p = 0.704). The in-hospital mortality rates were: 4.3%, 4.6%, and 5.3% for groups of patients with bipolar, unipolar and total hip endoprosthesis, respectively. Considering clinical outcomes, general health and costs, it can be concluded that the choice of endoprosthesis does not pose an obstacle to a patient's recovery.

Key words: Hip, Fracture, Endoprosthesis, Result, Function.

Introduction

The consequences of aging on the hip joint (osteoporosis, varisation of the femoral neck), the reduction of psycho-physical abilities of a patient (neuromuscular incoordination, fear from activities) and comorbidities predispose the elderly to the hip joint fracture. The cumulative risk run by women was shown to be 18% while for men it amounted to 6% (1). Approximately 30% of bed capacity in surgical facilities is occupied by patients with this particular injury (2). The cost of treatment for patients with the hip fracture in the U.S. is exceeding $ 8.7 billion per year, and an assessment is that it would exceed 16 billion by the year 2040 (3).

Because of all the above-indicated reasons, a choice of the most rational treatment is important in medical and economic terms for patients and society as well. However, opinions about a type of endoprosthesis that should be implanted after femoral neck fracture differ from one author to another. Some authors prefer implantation of unipolar partial hip endoprosthesis, while others prefer

bipolar partial endoprosthesis after displaced femoral neck fracture in elderly persons (4-19). Total hip endoprostheses, according to a majority, achieve the best mid-term clinical outcome. But their disadvantages, compared with partial endoprostheses are as follows: more extensive and longer operative procedures, increased blood loss, increased infection risks and mortality, longer rehabilitation period and higher costs (20, 21). Total hip endoprosthesis was shown to be a satisfactory salvage procedure after failure of other surgical solutions for femoral neck fracture (22).

"In vitro" experiments cannot offer absolutely accurate data, due to many complex characteristics of structures of implant, bone, cement, and some uncertain numerical parameters. This emphasizes a need for clinical studies, which could ensure more reliable data about the behavior of different endoprosthetic devices "in vivo" in order to validate the present methods applied in treatment, but also to point to some critical moments. There is no published study which compared mid-term clinical outcomes among unipolar, bipolar and total hip endoprostheses after femoral neck fracture.

The aim of this study was to compare mid-term clinical outcomes after implantation of three different types of hip endoprosthesis after femoral neck fracture.

Patients and Methods

In the present study we collected hospital archive data only for patients with following inclusion criteria:

– dislocated medial femoral neck fracture (Garden type III and IV),

– absence of visible X ray, degenerative pathological changes,

– unilateral lesion,

– implantation of cemented hip endoprosthesis as primary procedure by lateral surgical hip approach,

– minimal follow-up period of 18 months,

– surgical procedure performed in Jan/88-Jun/01 period

The patients were divided into three groups:

– The first group consisted of 32 patients treated with partial unipolar hip endoprosthesis manufactured by "Austin Moore, Instrumentaria DOO Zagreb, Croatia",

– The second group consisted of 70 patients treated with partial bipolar hip endoprosthesis manufactured by "Vario-cup, Link GmbH&Co Hamburg, Germany",

– The third group consisted of 43 patients treated with total hip endoprosthesis manufactured by "Lubinus, Link GmbH&Co Hamburg, Germany". Three groups differed only in respect of the type of implanted endoprosthesis.

The unipolar partial endoprosthesis is constructed as one piece; the head, neck and the stem are made from the same material, differing only in the radius of the head and length of the neck and stem. The bipolar endoprosthesis consists of a smaller polyethylene cup, tightened to the stem. The external cup`s outside surface articulates with the acetabulum and inside surface with the internal cup. This double mobility decreases a number of motions between the acetabular cartilage and the articulation surface of the endoprosthesis, and consequently, it provokes acetabular erosion. In case of complications, it is possible to transform the bipolar endoprosthesis into the total hip endoprosthesis by implanting the artificial acetabulum, while the unipolar partial endoprosthesis has to be completely removed in case of complications.

All patients were followed up for an average period of 3.8 ± 1.9 years and their clinical outcomes were evaluated by the Harris Hip Score System.

The Harris Hip Score System evaluates the following hip parameters:

– hip pain (painless hip 44 points),

– presence of deformity (no deformity 4 points),

– range of motions (full motions 5 points),

– functional tests (complete functionality 47 points):

– completely healthy hip100 points.

We have chosen the Harris Hip Score System for evaluation of mid term clinical outcomes because of its high validity and accuracy, but also for its easy comparison with other evaluation scales (23, 24). Henning deems that satisfactory and better clinical outcomes are over 50 points by HHS, but for Lestrange, fair clinical outcomes are HHS values over 70 points (25, 26).

Statistical analysis was performed by Chi^2 test and one-way ANOVA (Analysis of variance). The p value of 0.05 was deemed statistically significant.

Results

Hospital archive data for 692 patients was collected according to the above mentioned inclusion criteria. Patients lost to follow-up, dead patients and patients with incomplete data were excluded from any further analysis. In the examined group of one hundred forty-five patients, 85% were females with the average age of 76 ± 5.1 y. A mean period from injury to surgery was 2.9 ± 1.3 days. The most common comorbidities were: cardiovascular diseases in 66% (96 patients), diabetes mellitus in 17% (25 patients), neurological diseases in 13% (19 patients) and pulmonary diseases in 10% (14 patients).

There were no statistically significant differences among the three described groups in respect of parameters which could influence the mid-term clinical outcome (age, follow-up, comorbidities).

Total hip endoprosthesis achieved the highest values by the Harris Hip Score, 78.23 ± 22.46, but it did not differ significantly (p = 0.704) from the scores of unipolar and bipolar hip endoprostheses.

Table 1. Age, follow-up, and frequency of comorbidities with level of significance in three groups.

Parameter	Unipolar p.	Bipolar p.	Total p.	p
Age[1]	75	78	73	0.091
Follow up[1]	3.31	3.91	4.08	0.073
Cardio vascular[2]	53	68	70	>0.1
Neurological[2]	16	11	13	>0.1
Pulmonary[2]	12	10	11	>0.1
Diabetes mellitus[2]	16	17	16	>0.1
Pain[1]	37.7	37.9	36.87	>0.1
Limping[1]	6.27	9.63	7.77	0.001
Hhs[1]	72.06	74.27	78.23	>0.1
In-hospital mortality[2]	4.3	4.6	5.3	>0.1

[1]-numerical parameters measured in years, statistical difference calculated by ANOVA; [2]–frequencies of diseases measured in percentages, statistical difference calculated by Chi^2-test

The mean of HHS values in all three groups (74.95 ± 19.52 96), can be considered as fair, according to Lestrange (26). The patients with implanted unipolar endoprosthesis had a lower in-hospital mortality rate, but statistically not significant.

Discussion

In our study, the majority of patients were octogenarian females with numerous comorbidities. Comorbidities and pre-injury conditions are significant factors that influence hip fracture after a mild trauma (27). Since the percentage of elderly people has lately increased geriatric diseases and injuries are becoming an increasingly important issue. Due to difficulties in treatment of the hip fracture, the recovery period is exhausting for patients, but at the same time expensive for society.

The Harris Hip Score System is an objective method of measuring mid-term clinical outcomes and the best tool in evaluating treatment. An average value of HHS 74.95 ± 19.52 (similar to results obtained in other studies) indicated that a patient

with implanted hip endoprosthesis after the femoral neck fracture had periodic pain that did not affect her/his activities; the patient could walk without a major problem for at least 500 meters, limped to a certain degree, used a cane, could climb stairs holding a handrail, sat in the chair for a long time, put on shoes and socks with minor difficulties, used the public transportation and had no distinct deformity of the hip. With that level of hip functionality regained after endoprosthetic hip replacement, our patients are able to live independently which, in turn, is the main personal, medical and social goal for their age. Although average HHSs in all three groups were in the domain of "fair" (by Lestrange), HHS of the bipolar partial endoprosthesis evaluated in this study is 2 points above HHS of the unipolar endoprosthesis (74 vs. 72), and only 4 points below (74 vs.78) for total endoprosthesis

The mean in-hospital mortality rate in all three groups (4.7%) was similar to Goldhill's report (5.7%), and Lyons's report (4.3%) (28, 29). A slightly higher in-hospital mortality rate in the group of patients with implanted total hip endoprostheses (5.3%) compared with groups of patients with partial hip endoprostheses (4.5%) could be attributed to a longer and more extensive surgery of implantation of total hip endoprosthesis and an increased blood loss during surgery. Patients with the implanted bipolar endoprosthesis had the lowest level of pain, limp and in-hospital mortality rate. Ichihashi favours the use of the bipolar endoprosthesis in femoral neck fractures even after avascular necrosis of the femoral head, though he was uncertain about the use of this endoprosthesis in patients suffering from hip arthrosis (30).

Considering the clinical results of this study, blood loss, duration of surgical procedure, possibility of revision, time of functional recovery and price of endoprosthesis, all types of endoprostheses are valuable for surgery of the hip. Although our groups were uniform and their HHS values were similar, a decision about the type of endoprosthesis should not be uniform. Total endoprosthesis is a logical option for patients with the previously damaged hip; unipolar endoprosthesis is a most rational choice for patients with a shorter life expectancy, while for other patients with displaced femoral neck fractures, the bipolar partial endoprosthesis seems to be an acceptable and middle-ground approach to treatment.

The limitations of this study are as follows: a relatively small number of participants, lack of severity of the illness score and a relatively short follow-up period. However, studies with similar limitations have been published in the literature and may have helped clinicians in decision making. Clearly, a more comprehensive study on this subject, which would be helpful in answering newly arisen problems in this particular domain, is currently lacking.

In conclusion, a choice of endoprosthesis is not a crucial obstacle to a patient's recovery to the pre-surgery state. It is only natural that, on the one hand, a choice of an implant must be evaluated in accordance with the clinical benefits of a chosen endoprosthesis, while on the other hand, due attention should be paid to a patient's overall condition and cost-benefit analysis.

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Ultrasound-Guided Percutaneous Treatment of Liver Abscesses: Long Term Results in a Single Center

Enver Zerem[1], Goran Imamović[2]

[1]The Interventional Ultrasonography Department,
Internal Medicine Hospital,
University Clinical Center,
Tuzla, Bosnia and Herzegovina
[2]Internal Medicine Hospital,
University Clinical Center,
Tuzla, Bosnia and Herzegovina

Corresponding author:
Enver Zerem,
The University Clinical Center Tuzla,
Trnovac bb, Tuzla, Bosnia and Herzegovina
e-mail: zerem@inet.ba

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AIM: To analyze the results of ultrasound-guided percutaneous needle aspiration (PNA) and percutaneous catheter drainage (PCD) in the treatment of pyogenic liver abscesses. *Methods*: 71 patients (42 females and 29 males, average age 56.2±12.3) with pyogenic liver abscesses were treated with ultrasound guided PNA and/or PCD. Patients with liver abscess <50 mm and ≥50 mm in diameter were initially treated with PNA and with 8-French catheter drainage, respectively. The clinical characteristics, underlying diseases, organism spectra, therapeutic methods, and mortality rates were analyzed. *Results*: PNA was performed in 35 patients (49.3%) as initial treatment. In 14 patients needle aspiration was a definitive and successful treatment, while 17 out of 35 patients (48.6%) had a recurrence of abscess and required continuous catheter drainage. After PNA three patients were referred for surgery. In 13 patients PCD applied after PNA was a definitive and successful treatment, but 4 patients had to be transferred for surgery in this specific group. In 36 patients (50.7%) PCD was performed initially. In 12 patients PCD was performed twice. In all 7 deceased patients malignancy was the underlying condition. Forty-one patients (57.7%) underwent surgical interventions in the abdomen before percutaneous treatment. Cultures were positive in 54 patients (76 %). There were no complications related to the procedure. *Conclusion*: Ultrasound-guided percutaneous treatment of liver abscess is a safe and effective alternative to surgery, especially in critically ill patients. We recommend PNA and PCD as primary treatments for liver abscesses <50 mm and ≥50 mm in the longest diameter, respectively.

Key words: Interventional ultrasound, Needle aspiration, Catheter drainage, Pyogenic liver abscess.

Introduction

Pyogenic liver abscesses are usually caused by infection orginating in the biliary or intestinal tracts. This is potentially a life-threatening disease, and therefore, appropriate diagnosis and treatment are very important. Abdominal ultrasonografy and computerized tomography are most frequently used in the diagnosis of a liver abscess. The diagnosis can be confirmed by image-guided percutaneous aspiration and drainage, and subsequently, the appropriate therapy can be planned according to culture and antibiogram (1-3). In the past, the antibiotic therapy and surgical drainage were considered the treatments of choice for a liver abscess. Current therapeutic strategies established percutaneous drainage of liver abscesses instead of surgical treatment, with good results. This treatment is especially recommended in critically ill patients (4-7).

Continuous catheter drainage is now widely accepted and, in combination with antibiotics, is considered a safe and effective method of care for liver abscesses (8, 9). Some authors favour intermittent needle aspiration as equally effective and safe, but at the same time an easier, simpler, less aggressive, and cost-effective method (10-13).

Our study was undertaken to determine the current role of percutaneous ultrasound-guided drainage as an alternative to surgical treatment of liver abscesses, but also to analyze the role of needle aspiration and continuous catheter drainage in the treatment of liver absesses.

Patients and Methods

Patients

The records of patients, who underwent percutaneous treatment of pyogenic liver abscesses and were discharged from our hospital in the period from January, 1991 to May, 2002, were reviewed. Cases were identified by searching the hospital database of all patients discharged with the diagnosis of liver abscess during the study period. The diagnosis of liver abscess was made on the basis of clinical and imaging findings with ultrasound or computed tomography. The demographic, clinical, and laboratory findings, underlying diseases, organism spectra, abscesses' number and size, as well as mortality rates were analyzed. The size of abscess was recorded as the longest diameter in either solitary or multiple abscesses. The decision to opt either for percutaneous needle aspiration (PNA) or percutaneous catheter drainage (PCD) was made on the basis of the longest diameter of an abscess. Patients with the liver abscess shorter than 50 mm in maximal diameter were initially treated with PNA. In case of recurring abscess collection, an 8-French catheter for continuous drainage was introduced. Patients with abscess equal to or greater than 50 mm in diameter were initially treated with PCD.

All surviving patients were followed up clinically for six months after percutaneous treatment. Patients' response to treatment in terms of clinical symptoms and laboratory test results were monitored. The criteria for a successful treatment were set in regard to whether the infection had subsided clinically or whether there had been sonographic evidence of abscess resolution.

Patients were followed up in the out-patients' clinic bi-weekly after the discharge from the hospital. Clinical examination, white blood cell count and neutrophillia, CRP and abdominal ultrasonography were performed on every follow- up visit.

Antibiotics policy

Upon admission, all patients were treated with intravenous Ampicillin 500 mg qid, Cefuroxime 750 mg tid, and Metronidazole 500 mg tid. The antibiotics were adjusted according to the results of culture and sensitivity tests of pus aspirated at the time of the

drainage procedure. The antibiotics adjustment was done immediately after the sensitivity test result became available. Patients with negative culture results were continuously treated with a combination of Ampicillin, Cefuroxime, and Metronidasole. Intravenous antibiotics were continued for 10 days. If the antibiotic therapy was changed according to sensitivity test results, the new antibiotics were administered for 10 days. Patients were discharged earlier with a percutaneous intravenous catheter inserted for a completion of therapy, provided that fever had subsided for at least 48 hours. The patients were then administered the appropriate oral antibiotics for a six-week treatment period.

Intervention

All percutaneous interventions were performed under ultrasound guidance with a General Electric Logiq 400 machine and 3,5 MHz curvilinear transducer (General Electric, Chicago, USA). A free-hand technique using an 18 Gauge disposable trocar needle (Boston Scientific, Boston, USA) of varying lengths (10-16cm) was employed for puncturing of abscesses. A sample of pus was routinely taken and sent for microbiological analysis, including microscopy, culture and antibiotics sensitivity tests.

Percutaneous drainage

Two to five mililiters of undiluted contrast media were instilled slowly under fluoroscopic control into the abscess cavity through the 18 G needle to guide insertion of a 0,038" Amplatz extra-stiff into the abscess. After serial dilatation, an 8F multisidehole pigtail catheter (Boston Scientific, Boston, USA) was inserted into the largest cavity of the abscess. Aspiration was then performed with the catheter until no more pus could be removed. The catheter was then secured to the skin for continuous external drainage and the patient was sent back to the ward. When catheter output stopped during 24 hours, a follow-up sonography was performed. If an abscess cavity was absent, the catheter was removed. If a residual cavity was present, the catheter was flushed with normal saline and aspirated until the return was clear. Residual loculations of abscesses were treated with catheter repositioning and aspiration. Further sonography was performed three days later and the catheter was removed if it remained unproductive. Otherwise, the catheter was left in-situ until it stopped producing any content. Sonography was repeated every 3 days until the cavity either disappeared or showed a significant reduction along with a clinical recovery.

Needle aspiration

Complete evacuation of pus from each cavity was attempted with 18G disposable trocar needle (Boston Scientific). The needle tip was inserted into the abscess for a complete pus removal. Sonography was performed every 3 days and the size of the abscess was recorded. If there was neither any clinical improvement nor any reduction in the size of abscess cavity, the catheter for continuous drainage was introduced.

Statistical Analysis

Statistical analysis was done by using the MedCalc v. 8.0.statistical software. Quantitative variables were compared by using two-sample t-test for independent samples, whereas categorical variables were analyzed by Fisher's exact test. Statistical level of $p<0.05$ was considered as significant for all the performed tests.

Results

Liver abscess was diagnosed in 71 patients during the study period. There were 42 females and 29 males, with the average (± SD) age of 56.2±12.3 (range 17-76).

Prior to hospital admission patients had shown symptoms for a mean of 17.8 ± 15.2 days (range 1-52). Forty-one patients (57.7%) underwent surgical interventions in the abdomen before percutaneous treatment. The symptoms, signs and results of routine haematology and biochemistry tests upon admission are shown in Table 1.

Table 1. Main complaints and clinical findings, haematology and biochemistry tests on the day of admission in 71 patients with liver abscess

Test	Median (range)	Normal	Abnormal result n (%)
Fever	–	–	51 (72)
Abdominal pain	–	–	49 (69)
Night sweats	–	–	31 (44)
Weight loss	–	–	25 (35)
Hepatomegaly	–	–	23 (32)
Jaundice	–	–	14 (20)
ALT (U/l)	89 (12-390)	30-65	49 (69)
AST (U/l)	48 (19-345)	15-37	35 (49)
ALP (U/l)	373 (102-905)	50-136	47 (66)
Bilirubin (µmol/l)	15 (4-456)	0-17	26 (37)
White cell count (x109/l)	18.3 (6.5-32.9)	(5-8)	67 (94)
Neutrophilia (x109/l)	13.2 (4.6-31.3)	1.7-6.5	69 (97)

ALT: alanine aminotransferase; AST: aspartate aminotransferase; ALP: alkaline phosphatase

Twenty-three (35%) patients had a normal liver function on admission, while 9 patients (13%) had a normal white blood cell count.

A potential underlying disease for liver abscess was found in 59 out of 71 patients (83%). The spread of infection via the biliary tract was more frequent than via the portal venous system (Table 2).

In 14 patients with liver abscess the underlying disease was diagnosed as a result of investigations conducted after the identification of liver abscess.The following underlying diseases were found: inflammatory bowel disease in 5 patients (3 cases of Crohn´s disease, 2 of colitis), 5 patients with diverticulitis, 3 with gall-bladder cancer, and one patient with a track between peptic ulcer and liver abscess.

Table 2. Underlying pathology in 71 patients with pyogenic liver abscess

Cause	n (%)
Biliary	32 (45)
Status post cholecystectomiam	12 (17)
Deviscerated hydatid cyst	8(11)
Trauma	7 (10)
Biliary malignancy	5 (7)
Portal	27 (38)
Stomach surgery	9 (13)
Inflammatory bowel disease	7 (10)
Diverticulitis	6 (8)
Status post appendectomiam	5 (7)
Cryptogenic	12 (17)
Total	71 (100)

Frank pus was obtained from the abscesses in all 71 patients. A microbial pathogen was isolated in 54 patients (76%). The blood culture was positive in 14 out of 54 patients (26%) and abscess culture in 41 out of 54 patients (76%). All patients who tested positive in regard to blood and abscess culture had identical pathogens. More than one organism were isolated in 23.9% of patients with positive culture. More than one organism were identified only in pyogenic liver abscesses that were caused by infection originating in the intestinal tract (Table 3). All patients received the appropriate antibiotic therapy. Fourteen patients had the antibiotics therapy changed after pus culture and sensitivity test were obtained; the adjusted antibiotics therapy included Ceftazidime (n = 5), Imipenem (n = 5), and Klaritromycine (n = 4).

Forty patients (56%) with liver abscess had a single abscess; 31 (44%) had multiple abscesses. Abscess formation was in the right lobe in 42 patients (59%), while in 11 patients (16%) it was found in the left lobe. Abscess formation in both lobes was found in 18 patients (25%). The size of abscesses ranged from 32 to 112 mm, with a mean of

Table 3. Bacterial isolates in 54 patients with pyogenic iver abscess

Bacteria	n	Isolated from pus (n)
Gram-negative (total)	29	22
Escherichia coli	12	10
Pseudomonas species	4	3
Klebsiella pneumoniae	12	8
Morganella morgani	1	1
Gram-positive (total)	33	25
Streptococcus milleri	14	10
-Haemolytic *Streptococcus*	6	5
Enterococcus	8	7
Streptococcus pneumoniae	2	1
Staphylococcus aureus	3	2
Anaerobes	6	4
Bacteroides species	6	4
Total	67	51

68.8 ± 9.5 mm. Statistical analysis revealed that the presence of the underlying disease correlated neither with the size or number of abscesses, nor with age, gender, and species of microorganism.

Needle aspiration was performed in 35 patients (49.3%) as initial treatment. In 14 patients needle aspiration was a definitive and successful treatment. One patient died after PNA due to complications caused by biliary malignancy. After PNA treatment three patients were referred for surgery, two out of three with a favourable outcome while a third patient died after PNA treatment and a new surgery due to the recurrence of pancreas malignancy (Table 4). Seventeen out of 35 patients (48.6%) had a recurrence of abscess collection and required continuous percutaneous drainage; they were also administered antibiotics instilled through the catheter. In 13 patients PCD applied after PNA was a definitive and successful treatment although 4 patients in this specific group were transferred for surgery after PNA and PCD treatment.

In 36 patients (50.7%) with abscess collection greater than 50 mm in diameter percutaneous catheter drainage was initially performed (Table 4).

Table 4. Type of treatment and outcome in 71 patients with pyogenic liver abscess

Treatment method	*n*	Mean±SD hospital stay (days)	Death
PNA	15	10.6± 7.2	1
PNA/PCD	13	16.3± 9.1	–
PCDx1	23	26.5±12.2	–
PCDx2	12	34.6±12.8	1
PNA / Surgery	3	23.8±10.7	2
PCD / Surgery	1	27.9±16.8	–
PNA/PCD/Surgery	4	41.6±19.7	3
Total	71	24.1±14.3	7

PNA: percutaneous needle aspiration; PCD: percutaneous catheter drainage.

Twelve patients who had a persistent abscess cavity or poor drainage underwent percutaneous catheter drainage two times. PCD was a definitive and successful treatment for 37 patients; for 13 patients after PNA and PCD treatment while for 11 patients after two PCDs. One patient with percutaneous drainage died due to the recurrence of stomach malignancy while another was eventually referred for surgery, with a favourable outcome. The mean hospital stay (±SD) was 24.1 ± 14.3 days. The shortest hospital stay was in the group with PNA (Table 4). The mortality rate was 15.5 % (Table 4). All 7 deceased patients died of predisposing factors such as malignancy rather than of pyogenic liver abscess itself.

Discussion

Pyogenic liver abscess commonly develops secondary to biliary infections such as cholecystitis, cholangitis, infection of devisceratated liver hydatid cyst (14) or infection of organs that are drained by the portal vein (diverticulitis, appendicitis, inflamatory bowel disease) (15). While studies of patients with infection of organs that are drained by portal vein suggest an increased incidence of portal bacteremia, the development of

liver abscesses in these patients is relatively rare (15). In the majority of cases, more than one organism have been isolated from their abscesses (16). In our study more than one organism were identified only in pyogenic liver abscesses that were caused by infection originating in the intestinal tract.

In the past, antibiotic therapy and surgical drainage were considered the treatments of choice for liver abscesses. The recent trend in management of liver abscesses has increasingly been in favour of non-surgical methods. Several investigations (3-12) have shown that a significant proportion of patients can be treated with a combination of parenteral antibiotics and image-guided percutaneous treatment with excellent results, but a question whether to perform percutaneous catheter drainage or intermittent needle aspiration remains controversial.

Some authors reported their positive experience with PNA treatment as a safe and effective approach with recommendations that it should be considered a first-line treatment in the management of liver abscesses. A majority of abscesses required no more than two aspirations, irrespective of their size (10-13). The use of catheters is reserved for cases of rapid re-accumulation of exudate and for those without a general improvement of the patient's condition (17). The findings in other studies suggest that continuous catheter drainage is a reliable and effective approach to the treatment of liver abscesses (3, 18-24).

In comparison with surgery percutaneous treatment is significantly advantageous for several reasons: a) external drainage does not involve major risks in respect of intraabdominal spillage or risks related to administration of general anesthesia b) it is time and cost effective c) it ensures a better compliance and easier nursing care. This treatment is especially recommended for patients in a critical condition postoperatively, but also when the risks of administering general anesthesia or surgical drainage are substantial (7).

More than half of patients involved in our study had surgical interventions in the abdomen or retroperitoneum earlier, and as a result, PCD or PNA were the only available treatments for those patients. Percutaneous treatment was a successful and definitive treatment in almost all of our patients. All deceased patients died of the underlying malignant diseases.

We recommend PNA, primarily in the treatment of liver abscesses with the maximal diameter shorter than 50 mm, since our experience showed that PNA was sufficient to solve these abscesses in about 50% of cases. Also, this method is much simpler and less aggressive than PCD; PNA treatment involves a shorter hospital stay and lower costs. If PNA was insufficient, we subsequently applied the drainage technique using an 8-French pigtail catheters.

In patients with liver abscesses longer than or equal to 50 mm in the maximal diameter we initially introduced an 8-French catheter.When persistence of clinical signs was combined with a poor drainage, the correct location of the catheter had to be verified. The possibility of placing an additional catheter should always be explored if the abscess persisted.

Conclusion

In conclusion, ultrasound-guided percutaneous treatment of liver abscesses is a safe and effective alternative to surgery because it enables us to avoid perioperative complications, providing at the same time a better compliance and easier nursing care. We recommend PNA primarily in the treatment of liver abscesses smaller than 50 mm while PCD should be applied for those larger than 50 mm in the longest diameter. The results of our study, along with those from the previous ones, may contribute to finding a de-

finitive answer whether a first-line treatment for liver abscesses is percutaneous catheter drainage or intermittent needle aspiration.

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Somatic diseases and mental disorders: should they be differentiated?

Dušan Kecmanović

Academy of Sciences and Arts of
Bosnia and Herzegovina, Bistrik 7
Sarajevo, Bosnia and Herzegovina

Corresponding author:
Dušan Kecmanović
304 King Street, Newtown,
NSW 2042, Sydney, Australia
e-mail: dkecmanovic@mail2me.com.au

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The authors of DSM-III and DSM-IV, as well as some other renowned scholars (e.g., M. Roth, R.E. Kendell) argue that the terms *somatic (physical)* and *mental disorder* should be abandoned because "there is much that is physical in the so-called mental disorders, and much mental in the so-called physical disorders". The author of this paper challenges such a view. He points that differences between somatic diseases and mental disorders largely outweigh their similarities. That is why, no matter how much they implicate an outdated mind-body duality, the terms *somatic disease* and *mental disorder* should be preserved.

Key words: Somatic disease, Mental disorder, Differences

Introduction

Lay people make a distinction between somatic disease and mental disorder. None of them would call pneumonia a mental disorder, or schizophrenia a somatic disease. Doctors and other health professionals would not make such a mistake, either. The distinction between somatic disease and mental disorder is *tacit knowledge*, to use Polonyi's phrase (1).

Nevertheless, many renowned scholars (2, 3, 4, 5) argue that somatic disease and mental disorder are fundamentally one and the same phenomenon. Thus Roth and Kroll assert: "To be precise, even the term 'mental illness' is a misnomer; it is based upon an outdated distinction between body and mind that remains a philosophical, but not a biological, dilemma. All illnesses eventually interfere with functioning in psychological, social, economic and physical spheres, place the affected person at a biological disadvantage, bring suffering to self and others, are present at times without the ill person recognizing it, have acute and chronic forms, and are associated with increased mortality" (2). Kendell, one of the most vociferous advocates of the idea that mental versus physical disease is a false dichotomy, goes so far as to use the term "psychiatric disorders" instead of "mental disorders" in "Companion to Psychiatric Studies" (4). "We should talk of psychiatric illnesses and disorders rather

than of mental illnesses; and if we continue to refer to 'mental' and 'physical' illnesses we should preface both with 'so-called', to remind ourselves and our audience that these are archaic and deeply misleading terms"(5).

The authors of DSM-III and DSM-IV share Roth's and Kendell's view. They consider physical disease and mental disorder to be hard-to-distinguish phenomena. 'Although this volume is titled the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), the term *mental disorder* unfortunately implies a distinction between 'mental' disorders and 'physical' disorders that is a reductionist anachronism of mind/body dualism. A compelling literature documents that there is much 'physical' in 'mental' disorders and much 'mental' in 'physical' disorders. The problem raised by the term 'mental' disorders has been much clearer than its solution, and unfortunately, the term persists in the title of DSM-IV because we have not found an appropriate substitute' (6).

The other group of scholars (7, 8, 9, 10, 11, 12, 13) regards mental disorders as being quite different from somatic diseases. However, by strongly and strictly differentiating somatic diseases and mental disorders, they in various forms virtually negate the existence of mental disorders.

So Szasz (7, 8,) indicates that as long as 'mental patients' have no underlying physical abnormality they cannot be considered diseased. And when the underlying physical abnormality of a 'mental abnormality' has been determined, that sort of abnormality gets the status of a neurological or somatic disease. He writes: 'Disease means bodily disease. Gould's Medical Dictionary defines disease as a disturbance of an organ or a part of the *body*. The mind (whatever it is) is not an organ or part of the body. Hence, it cannot be diseased in the same sense as the body can. When we speak of mental illness, then, we speak, metaphorically. When a metaphor is mistaken for reality and used for social purposes, then we have the making of a myth. The concepts of mental health and mental illness are mythological concepts, used strategically to advance some social interests and to retard others (7).

The basic premise of Szasz's line of reasoning is flawed. The known pathological substrate is not a prerequisite for the existence of either somatic or mental disturbance. The fact that one hundred years ago we did not know the pathological underpinnings of a great number of somatic diseases did not make them less real or irrelevant for medicine. The same holds for mental disorders.

Eysenck, on his part, argued that the vaguely defined field of psychiatry should be divided into two parts: a small medical part 'dealing with the effects of tumors, lesions, infections and other physical conditions', and a much larger behavioral part 'dealing with disorders of behaviour acquired through the ordinary processes of learning'(9).

If Eysenck's proposal had come into effect, the turf of psychiatry would have been occupied by neurologists and psychologists, with no place left for psychiatrists. Since mental disorder cannot be reduced either to the effects of 'tumors, lesions, infections and other physical conditions' on the psyche, or to learned behavior, Eysenck's 'reformist' idea in the last instance means that there is no such thing as mental disorder, or the greatest majority of mental disorders.

Laing's negation of mental disorder went along different lines (10, 11). With no reference to a possible cerebral pathology as part of mental disorders, first and foremost, of schizophrenia, Laing saw in schizophrenia a meaningful revolt against unbearable existential and social conditions, a way of coping with double-bind type of pressure placed on people by their family and society.

By conceptualizing schizophrenia as a 'revolutionary act' and in so far as the only route leading towards genuine mental sanity,

Laing, in fact, instrumentalized this mental disorder. The truth is that schizophrenia, as well as any other mental disorder, might in some instances be read as a reaction to a given social ambiance. However, if one claims that all mental disorders are but a way of coming to terms with a socially noxious environment, then they question the existence of mental disorders in those cases where such a way of looking at them is completely unfounded. And there are many such cases.

Sheff (12, 13) in his own way also denied the existence of mental disorder. When people have no answer to someone's weird behavior, argued Sheff, they label such behavior as the expression of mental disorder. What psychiatrists call mental disorder is in fact a way of adaptation to the shock of being labeled mentally disordered. Under the pressure of people's expectation to behave in tune with the label, those who are labeled as mentally disturbed sooner rather than later start behaving in accordance with the label. In Scheff's view, and the view of other protagonists of label theory, there is no mental disorder other than that created by the people and institutions that purport to treat it.

In my opinion, somatic disease and mental disorder should be differentiated, but in a way that does not put into question the existence of mental disorders. There are many differences between somatic diseases and mental disorders that fully justify their distinction without disputing the reality of mental disorders. The differences between somatic diseases and mental disorders, as I will show further down, far outweigh their similarities. Yet, none of the latter is so relevant to support the idea of their sameness.

The goal of this paper is to trace down in how many regards somatic diseases and mental disorders differ and, for that matter, to turn *tacit knowledge* about the difference between somatic diseases and mental disorders into *explicit knowledge*. To do so I will analyze dissimilarities of somatic diseases and mental disorders at several levels: etiology, clinical picture, diagnosis and social meaning of each one of these phenomena.

Etiology

As far as the etiology is concerned the same etiological factors take part in the genesis of both somatic diseases and mental disorders. There is such a huge body of data demonstrating the role played by biological, psychological and social variables in the engenderment and shaping of both somatic and mental disturbances, that it would be senseless to argue that somatic diseases are caused only by bio-physical agents and mental disorders only by psychological-social ones. There are few somatic diseases that, along with their biological causation, have not been to some degree conditioned, or at least triggered by psychological-social influences. On the other hand, the science of human genetics has recently made such remarkable progress that one cannot any longer turn a blind eye on hereditary factors in the formation of virtually any mental disorder. Furthermore, functional MRI is ever more providing insight into how the brain operates.

General assertion reads: the same group of agents (biological, psychological and social) gives rise to both somatic diseases and mental disorders. And that is where the similarities between somatic diseases and mental disorders begin and end.

If one takes a step further from this general statement, the differences between somatic diseases and mental disorders start to emerge. Even though, as stated earlier, biological, psychological, and social agents participate in the formation of both somatic diseases and mental disorders, physical-biological factors are more often responsible for the genesis of somatic diseases just as psychological-social factors are more relevant in the etiology of mental disorders. If that were not true, it would be hard to explain

why many mental disorders, in particular those which were called neurotic illnesses, can be efficiently managed by psychotherapy. On the other hand, psychotherapy is not a treatment of choice for virtually any somatic disease. The reasonable assumption is that the disturbances, conditioned to a greater extent by psychological-social factors, would better respond to psychotherapy. Similarly, the disturbances, in whose etiology biological-factors played a major role, would be more efficiently treated by physical-biological therapeutic techniques.

There are two major points in any discussion about the etiology of mental disorders. The first is the biological (material) foundation of all mental phenomena, and related to it is the biological basis of mental disorders; the second is the nature of the relation between cerebral and mental occurrences in general, and cerebral and mental pathology in particular.

The brain is the locus of the origin of psyche. That is a general statement very few psychiatrists, regardless of their general conceptual orientation, would be keen to dismiss nowadays.. So far, however, this general assertion has not proved to be of much help in tracing down the origin of a majority of mental disorders. Joseph Glenmullen, clinical instructor in psychiatry at Harvard Medical School, wrote: 'In medicine, strict criteria exist for calling a condition a disease. In addition to a predictable cluster of symptoms, the cause of the symptoms or some understanding of their physiology must be established…Psychiatry is unique among medical specialties in that… we do not yet have proof either of the cause or the physiology for any psychiatric diagnosis…In recent decades, we have had no shortage of alleged biochemical imbalances for psychiatric conditions. Diligent though these attempts have been, not one has been proved. It has just been opposite. (14). This view has been shared by many scholars (15, 16,17).

Interestingly enough, when the underlying somatic pathology of some disorders that about one hundred years ago were considered to be functional in a sense of mental, like, for example, epilepsy, Parkinson's disease, and Huntington's disease was discovered, they started to be considered as neurological diseases rather than psychiatric disorders.

Unlike in psychiatry, the somatic pathology of a majority of somatic diseases is now being found. (This does not imply that the appropriate cure has also been found.)

As stated earlier, a second major point in discussion of the etiology of both somatic and mental disorders is the nature of relations between physical and mental occurrences. The question is as follows: how does it happen that neuro-electrical, biochemical, and other processes produce feelings, thoughts, memory, cognition? How does the subjective experience arise from neural computation? How do the two substantially different phenomena: the material (neurotransmitters, neural associations, etc.) and mental (thoughts, affection, memories, etc.) relate to one another? How does the former get transformed into the latter?

Psychiatrists may say that it is a philosophical question, and that it is not up to them to deal with it. However, no matter how much they ignore the fundamental question of the nature of the relationship between the material and the mental and, for that matter, between the brain and the mind, it is a question which, as long as it remains unanswered, casts a long shadow on an increasing biological knowledge base for understanding the somatic origins of mental disorders. The question relates to the fundamental discontinuity in the hierarchical sequence of psychiatric explanation that makes the relationship between such issues as metabolism and misunderstanding obscure (18).

The idea of the transformation of the material into the mental is at the heart of the ac-

knowledgment that the brain is the place of birth of psyche, and of the notion that biological disorders underpin mental disorders; and still, such transformation is beyond our comprehension. To be aware of that question means to be cognizant of hard-to-surmount hurdles psychiatrists have to face up to in their day-to-day practice. 'As contemporary philosophers have stressed, the irreducible subjectivity of consciousness defies description in non-mental terms…Hence the language of psychology and the language of biology involve two different levels of discourse when working with a patient'(19).

Things are quite different when the etiology of somatic diseases is in question. Nobody is at pains to understand how physical pathology produces the signs of, for example, bacterial pneumonia, or uremia, or diabetes mellitus. Physical occurrences have physical effects. There is no need to resort to philosophical interpretation. Things seem to be self-evident.

There is one more point of difference between somatic diseases and mental disorders in regard to their etiology. There are as many etiologies of mental disorders as there are conceptions about the nature of mental disorders. The truth is that some conceptions are more applicable to some sorts of mental disorders. However, the advocates of each single conception argue that their conception is sufficient and binding for all mental pathology. Furthermore, the epistemological premises of various general concepts about the nature, causes and treatments of mental disorders are incompatible with one another. They tend to be more than mere differences in regard to perspectives; each is an encompassing view, resting on certain assumptions of legitimacy and importance, and each develops, in part, in opposition to the other (20).

I will mention just a few conceptual models in psychiatry. *Disease model* regards mental malfunction as a consequence of physical and chemical changes primarily in the brain; sometimes in other parts of the body, as well. *Psychodynamic model* proposes that how we feel, what we perceive and what we do is influenced by competing forces which are largely unconscious. According to the *social model* mental illness is related to social factors. This model is based on general theories of groups, communities and cultures.

Given the multitude of conceptual approaches in psychiatry it is small wonder that psychiatrists, depending on their conceptual orientation, find relevant etiological agents of a particular mental disorder either in somatic pathology, or in unconscious forces, or in social influences.

That is not the case with health professionals in fields other than psychiatry. In most instances they share the same conceptual approach. When one has, for example, pneumonia or uremia, none of specialists in internal medicine they seek help from will say that the etiology of their somatic disturbance is in their unresolved mental conflicts, or in an anomic social environment they have lived in.

That is not the case with psychiatrists. If you approach a psychiatrist asking for the origin of your mental difficulties, the answer you will be given depends on the psychiatrist's conceptual orientation. 'It matters a great deal how a psychiatrist is taught to look at mental illness, because the 'how' cannot be clearly separated from the 'what' of the disease. To understand the psychiatric ways of seeing, we have to proceed knowing that what counts as 'fact' is a tinted window onto the world you cannot step outside to see' (21).

Bodkin, Klitzman and Pope (22) carried out a study among psychiatrists that proves that most of them are conceptually biased. The authors of the study sent a questionnaire to 435 academic psychiatrists to assess whether they were primarily biologically or primarily psycho-dynamically oriented, or whether they demonstrated evidence of

mixing both approaches. Even though most clinicians claimed to be open to both approaches and to mix them, the researchers found that they could classify 27 percent of practitioners as biological and 37 percent as psychotherapeutic. These practitioners spent more than three-fourths of their time solely working in tune with their approach. Ghaemi, on his part, indicates that in his experience most psychiatrists claim to be bio-psycho-social eclectics. 'Yet in practice, only one-third is in fact eclectics. Most clinicians are eclectics only in theory; they are dogmatists in practice' (23).

As the *bio-psycho-social* model is usually opposed to the above mentioned individual models, it requires a comment in the context of this paper. The bio-psycho-social model has been spelt out most clearly by Engel (24, 25). This model is not just one of many competing possibilities within the contested field of mental illness and psychiatry. By assigning equal weight to the entire gamut of different interpretative positions the bio-psycho-social model is conceived of as an alternative to the reductive explanatory models that dominate psychiatry. However, the problem with this model in psychiatry is that it does not provide a clue as to how the data from the individual conceptual models could be mutually related and ordered into a new coherent model. The bio-psycho-social model is praiseworthy in so far as it strives to conceptually integrate all levels of human existence. However, the theory or, more accurately, the general orientation of this model does not have its (psychiatric) practice because the theory of the bio-psycho-social model, apart from advocating conceptual high ground of the position that equally respects all dimensions of human existence, does not teach us how to explain or understand and treat individual mental disorders. The bio-psycho-social model itself, as Weiner (26) noted, is easier to define in a negative way (i.e. in terms of what it is not), than in a positive manner that does not at the same time appear trite.

Those clinicians who do not want to be aligned with any particular model, and who insist on the advantages of an all-encompassing approach in fact combine elements of the existing different conceptual models in their everyday clinical work. They intentionally 'underplay differences' and 'homogenize complexities' in clinical explanation (27). One cannot ignore data from individual models for by doing so, they would ignore psychiatric knowledge. The bio-psycho-social model has not superseded other individual models within psychiatry. It has argued a holistic position and repudiated all sorts of undimensional explanations, but it has failed to produce substantially new psychiatric knowledge.On the other hand, each model captures important facets of clinical reality, yet disregards or even denies others (28). Today, the bio-psycho-social approach, combined with eclectism, has frequently come to mean simply avoiding a discussion of methods and assumptions in one's psychiatric work (23).

All the said differences between somatic diseases and mental disorders in regard to their etiology come from the fact that, unlike physical pathology, which can be reduced to biological-physical data, mental pathology is at the same time a physical and a mental-spiritual phenomenon. Mental pathology is mid-way between the physical and the mental-spiritual. The physical part of mental pathology is the object of investigation of the natural sciences (*Naturwissenschaften*). They look for observable influence of one occurrence on another that could be tested objectively and repeatedly. In order to assess the nature of the relation between two or more objects in an empirically verifiable form the natural sciences break down the external world into its elements. By doing so, they strive to formulate some general principles or rules governing the way in which ob-

jects, physical-biological data under defined circumstances relate to one another. On the other hand, the 'mental' of mental disorder can be properly dealt with by human sciences (*Geisteswissenschaften*). The *cause* is the key category of natural sciences, whereas the *meaning* is the key category of human sciences. The goal of natural sciences is to explain (*erklären)* natural phenomena. The human sciences aim at making us understand the meaning of people's intentions and actions. Unlike the natural sciences that, as stated, break down the whole into its parts, the human sciences are focused on the whole.

Jaspers, German psychiatrist turned philosopher, who laid down the foundations of psychopathology, largely elaborated this distinction in his seminal work 'General Psychopathology'. There is no better way to grasp what this distinction is all about than to cite Jaspers himself. 'In natural sciences, we find only causal connections but in psychology our bent for knowledge is satisfied with the comprehension of quite a different sort of connection. Psychic events 'emerge' out of each other in a way which we understand. Attacked people become angry and spring to the defense, cheated persons grow suspicious.' And Jaspers adds: 'The evidence for genetic understanding is something ultimate. When Nietzsche shows how an awareness of one's weakness, wretchedness and suffering gives rise to moral demands and religions of redemption, because in its roundabout way the psyche can gratify its will to power in spite of its weakness, we experience the force of his argument and are convinced… Such conviction is gained on the occasion of confronting human personality; it is not acquired through repetition of experience (29).

Clinical picture

In relation to the clinical picture the major difference between somatic diseases and mental disorders is that somatic diseases manifest themselves through primarily physical signs whereas mental disorders through predominantly mental symptoms. That is, after all, how laymen and health professionals alike usually differentiate somatic from mental disturbances.

One more subtle although no less important difference between somatic diseases and mental disorders is created by the role played by the personality in shaping the manifestations of both somatic diseases and mental disorders. The truth is that the personality affects various aspects of both somatic diseases and mental disorders; for example, one's perception of either somatic disease or mental disorder is heavily influenced by one's personal vulnerability, early conditioning, socioeconomic status, environmental stress and emotional arousal. In addition to that, the psychological make-up of an individual may affect to a significant degree the extent of the disability produced by the somatic disease or mental disorder, may color their manifestations and may even, in some instances, affect their course (30, 31).

However, the personality plays a far more important role not only in the engenderment, but also in shaping the clinical picture of mental disorders than of somatic diseases. Since somatic diseases are manifested mainly with physical signs, the influence of the individual's psyche on the transformation of structural-functional changes of some organ(s) (e.g., inflammation; degeneration; hyper- or hypofunction of particular hormones; impact of external force on the organism) into physical signs (e.g., edema, cough, high body temperature, the change of urine's color, tremor, intense sweating, difficulty in swallowing), that is, into the clinical picture of somatic diseases is inappreciable or none. That does not hold for mental disorders.

The personality of the patient is involved in the process of creation of the clinical picture even before the appearance of the first

symptoms of the disorder. A good number of mental disturbances originate in the particular psychological make-up of the individual. Furthermore, it is personality which struggles to counter the menacing mental imbalance at the very beginning of mental illness. Since mental defensive mechanisms are an integral part of the personality, it is personality which tries to find a sort of co-existence of the individual and the disturbing mental symptoms. By doing so, the personality abundantly tailors the clinical picture of any mental disorder. Hence the symptoms a mental patient presents with are an amalgam of putative somatic pathology and coping mechanisms of that particular individual.

The patient's reaction to their mental disturbance is a part of that particular mental disorder. So much so that in many cases it is hard to tell what are genuine symptoms of the disorder and what is the individual's reaction to the symptoms; so closely they are interwoven. However, whenever psychiatrists can differentiate these two kinds of phenomena they mention each of them in their description of the patient's clinical presentation. In a patient's reaction to their symptoms is mirrored their personality, and that is, among other things, why psychiatrists are expected to pay due attention to it.

Yet, in describing the clinical picture of a somatic disease physicians mostly ignore people's reaction to the signs they display. In somatic medicine the signs matter rather than the subjective interpretation of them. When, for example, an oncologist gives their assessment of the clinical picture of someone suffering from a particular kind of cancer, they very rarely, if at all, include the patient's reaction to the signs, least of all, the patient's reaction to the diagnosis of cancer.

Eventually, there are some other features that also differentiate somatic diseases from mental illnesses. Mental disorders express themselves primarily through cognitive, affective and behavioral symptoms, and it is cognition, emotions and behavior that make us what we are as individuals. Consequently, the afflicted individuals are in their own eyes and in the other people's perception identified with the illness (32). The terms such as 'a schizophrenic' or 'a neurotic' are widely used by laymen and health workers, alike. They designate that someone suffers from schizophrenia or neurosis. That is not the case with somatic diseases. Nobody is identified with, for example, renal calculosis, or inflamed gall bladder. There are no terms that would be used as identifiers of persons suffering from a particular somatic disease.

Diagnosis

Nowadays physicians, apart from anamnesis and the observation of signs, diagnose somatic diseases more and more on the basis of laboratory tests and imaging techniques. The etiology of a good number of somatic diseases has been unveiled, and structural and functional standards of what is normal and what is pathological have been established. Such a diagnostic approach, that is in fact etiological, has increased the reliability of diagnoses in somatic medicine.

As the etiology of mental disorders in most cases is unknown psychiatric diagnoses cannot be etiological. In diagnosing mental disorders psychiatrists have to rely on what patients tell them about how they feel, what they think, how they experience themselves and the surrounding world, as well as on patients' behavior. This kind of diagnosing has a great many imperfections. For example, patients are not always keen to talk about how they feel or what they think. Or they deliberately distort their feelings, or what they really think about someone or something. Or psychiatrists succumb to counter-transference feelings and misinterpret patients' attitudes, their assertiveness, and way-of-being. Besides, inexperienced

psychiatrists are not able to pose the right questions to patients. Or they cannot differentiate those patients' symptoms and ways of behaving that are more important in diagnostic terms from the symptoms and behavioral manifestations that are less important. Psychiatrists also have a great deal of difficulty to agree upon how a particular symptom should be interpreted, that is, what its meaning is within the whole clinical picture. Moreover, there is a disagreement among psychiatrists as to the cluster of symptoms which is sufficient and necessary for the diagnosis of a particular mental disorder.

The low reliability of psychiatric diagnosis is a result of all these contingencies of psychiatric diagnosis. That is why a set of measures has been taken in order to improve the reliability of psychiatric diagnosis: structured interviews, standardized meaning of psychopathological notions, operational definitions of mental disorders.

There is another reason why the reliability of psychiatric diagnosis has to be enhanced. There is no validity of a particular diagnosis without its high reliability. And it is the validity of a diagnosis that matters. If a diagnosis is valid in a sense of being well-founded, it cannot be put in question. The validity of a diagnosis makes that diagnosis real.

There is a substantial difference between somatic diseases and mental disorders as far as their validity is concerned. The diagnosis tests the hypothesis that particular signs and symptoms, which are commonly found together, belong to a particular class. 'In medical nosology (nosology of non-psychiatric disorders), class membership can often predict aspects of aetiology, pathogenesis, therapy, and prognosis, but this is not the case in psychiatry where diagnostic labels usually provide information only on correlation between symptoms' (33).

So far, various and numerous validators such as family aggregation or a characteristic course and outcome have been used in psychiatry to demonstrate clinical stability and provide indirect clues about mechanisms (34). In most cases there have been no convincing results. One might assert that a descriptive diagnosis – and the greatest majority of psychiatric diagnoses are descriptive – by definition cannot be valid, and hence, it is hardly surprising that all attempts at validating psychiatric diagnoses by examining their relationship to external measures, be it mechanisms or etiology, have failed.

Kendel and Jablensky (35) have recently questioned the opinion that the established etiology is a guarantor of the validity of a psychiatric diagnosis. In their view, the weakness of the validity criteria is that those criteria implicitly assume psychiatric disorders to be discrete entities; in other words, that there exists a natural boundary between one entity and the other. But there is no such a boundary between entities. They cite several studies the authors of which have attempted to demonstrate natural boundaries between related syndromes or between a common syndrome such as depression and normality, either by locating a 'zone of rarity' between them or by demonstrating a nonlinear relationship between the symptoms' profiles and a validating variable such as outcome or heritability. 'Most of such attempts have ended in failure (35).'

Thus, in the view of Kendel and Jablensky, it would be foolish to search for the etiology of a psychiatric syndrome whose existence at the level of the defining characteristics (symptoms) is doubtful. After all – the question arises – the etiology of which syndrome would be explored if 'our existing syndromal concepts do not reflect genuine discontinuities in the variation of symptoms'. Hence the question should be posed: what will happen if all future attempts at detecting discontinuities in symptoms do not bear fruit? If that happens, the prognosis is quite gloomy. 'Our existing typology will be abandoned and replaced by a dimensional classification (35).'

And will a dimensional classification pave the way for making the diagnosis of mental disorders more valid? I do not believe it would. Quite the inverse is more likely to happen.

Sartorius, writing about the revision of the classifications of mental disorders, maintains that current categorial classification might be replaced by a dimensional one, or by the use of both - dimensions and categories. Such an option is likely to make the validation of psychiatric diagnoses even more difficult. Moreover, 'the problem with a dimensional classification is that the making of a diagnosis – i.e. the profile of a patient on a fixed number of dimensions – might take a long time and would require the application of a number of instruments which the psychiatrists and other medical staff are unlikely to use (36).'

Due to all these conceptual difficulties in diagnosing mental disorders we seem to be a long way off from establishing the validity of psychiatric diagnoses. On the other hand, as stated, the problems involved in establishing the validity of the diagnosis of somatic diseases are much less intractable.

Social meaning of somatic disease and mental disorder

Social meaning of physical disease and mental disorder is quite different, too. The discrepancy in social meaning of somatic diseases and mental disorders is the result of their various social effects.

Both somatic diseases and mental disorders are a serious nuisance to humans and society, yet in a rather different way. Generally speaking, somatic diseases threaten the biological existence of individuals, and thereby, of human species. Even though the mortality rate of mental patients is higher than that of physically healthy people (37), mental disorders are significantly less threatening to humans than somatic diseases. Yet they do endanger them - socially. Mental disorders, primarily the psychotic ones, in short, include the disturbance of relations between Ego, as the representative of social reality, and both the irrational part of the personality (Id) and Super-Ego.

The respect of the common code makes communication possible in any community. The communication code consists of a huge number of rules and symbols of communication, both verbal (written) and nonverbal. The code is stable, even though not fixed once for all. In time people slightly change it. The point is that a system of signals and rules is commonly used by the whole community. People practice it without thinking about it; it is the key part, the key dimension of their social existence. Those people who make use of the existing communication code in meeting their needs and exercising their rights, in exhibiting their sorrows and their joyfulness, re-affirm it. They stay within the borders of the real and symbolic order established in community as a whole.. They are honored as members of the community. And those who show disrespect for the code by disrupting or violating it, are labeled as either outsiders or deviants.

There are many sorts of deviants. Mentally ill people are one of them.

There are two main differences between mentally ill people and the rest of deviants. Unlike other deviants, mentally ill people do not ignore the code intentionally. They do it under the pressure of their disturbed mental condition. They merely cannot do otherwise. And second, the repressive measures that are usually used to constrain people's deviant drives have proved unsuccessful in subduing socially disruptive behavior of those who are mentally disordered (38).

Mentally ill people are regarded as outsiders and estranged individuals sitting on the other side of the fence, not only because they do not respect the incumbent communicative code and symbols, but also because

they cannot be forced through the punishment and reward system to become social order abiding citizens.

The result of such a state of affairs regarding the deviant nature of mentally ill people is that they are always and everywhere perceived as alienated from the dominant social values, that is, from the social values which are cherished most in a given society or epoch. For example, in those societies in which religious beliefs and practice are a top priority, mentally ill people are labeled as devils, anti-Christ, demons. In societies wherein rationality is praised as the highest value, mentally ill people are considered to be irrational, deprived of the faculty to explain the world in rational terms. Where work, productivity, efficacy and pragmatism are the chief criterion of people's soundness, mentally ill people are viewed as lazy, unproductive, and good-for-nothing individuals.

Disturbing social effects of the way mentally ill people behave, relate to themselves and others, their manner of talking and acting, put them, literally and metaphorically, on the margins of society. In order to ensure that mentally ill people stay there for good, the community stigmatizes them. Once stigmatized, the mentally disordered individuals are most likely to carry the label for the rest of their lives (39, 40, 41). It is the stigma of mental disorder which strengthens social isolation of mentally ill people. Initially, the isolation is caused by the mental disturbance itself which alienates people from community, but later it is reinforced by the fear of the community in relation to the socially disruptive potential of the mentally ill.

The story with the somatically diseased is quite different. The social role of the physically ill is temporary, with the exception of those who are crippled or seriously and permanently incapacitated by the effects of a particular disease. In cases when such patients are released from everyday obligations because of their disease, they are not regarded as people who, really and/or potentially, threaten the existing social order. In most cases somatically diseased people fully respect the prevailing social and cultural code, that is, they abide by the rules governing the behavior of those who perform a social role of the diseased person. Since the behavior of the physically diseased is deemed to be predictable unlike that of the mentally ill, other people are not prompted to protect themselves from it. There is no good reason for such a reaction. On the other hand, the mentally ill are considered to be unpredictable, and it is the unpredictability of the mentally ill people that stirs up fear of them. People, threatened by those who break social norms and whose actions are hard to predict, tend to keep a distance from them by stigmatizing them or putting them in asylums which are commonly built on the outskirts of cities.

The violation of social norms by the mentally disordered has one more effect. The social norms are treasured. If people respect them, social life goes smoothly. The more people respect the social norms, the more each and every individual knows what they can expect from other people, and thereby the safer they feel.

Because of being social norm breakers, the mentally ill people are negatively valued. A widespread belief is that the mentally ill are more responsible for their calamity than the somatically diseased, which, in turn, supplies additional reason for their negative valuation. Unlike the mentally disordered people, the somatically diseased do not disrupt the extant social order, their behavior is regarded as predictable, and in most cases they are not held responsible for their predicament. As a result, their social rating is much higher than that of the mentally ill people.

A comparison might be made between the negative attitude towards the mentally disordered and the social management of four somatic diseases: plague in the Middle Ages, tuberculosis in the nineteenth century,

and cancer and AIDS in the twentieth and twenty-first centuries, respectively. All these four diseases were at particular periods and some still are used as a figure of speech or metaphors, lurid, unsavory and distorting metaphors at that The above diseases, thought to be intractable and capricious, have been experienced as the epitome of evil, and 'perceived not just as lethal but as dehumanizing, literally so' (42).

However, the meaning of these four diseases and their metaphors in particular, is exceptional, with no pair among somatic diseases. Yet, the above description of the social meaning of mental disorders, primarily of psychoses, which are at the heart of psychiatry, is fairly common.

Conclusion

The community of mental health workers and the psychiatric community in particular consider DSM-III and DSM-IV to be the *Psychiatric Bible*. Spitzer (43), who was in charge of conceptualizing DSM-III, wrote that the Task Force planned to include in the Introduction to DSM-III a statement that mental disorders were a subset of medical disorders. Apparently, it became clear that the inclusion of such a statement would only fan the fires of professional rivalry and might be a real obstacle to the use of DSM-III by non-medical health professionals who had used DSM-I and DSM-II in their clinical and research work. Therefore, due to a trivial rather than substantial reason DSM-III contains no explicit reference to mental disorders being a subset of medical disorders, as initially planned

Frances (44), who directed the fourth revision of DSM, claims that *mental disorder* and *physical disease* are unfortunate terms, preserving as they do an outdated mind-body duality, and asks: can anyone suggest better terms for us?

Obviously, the authors of the *Psychiatric Bible* share the view that the distinction between somatic diseases and mental disorders should be abolished because 'there is much that is physical in the so-called mental disorders, and much mental in the so-called physical disorders'.

I have shown the differences between somatic diseases and mental disorders to be numerous and significant, outweighing by and large their similarities. That is why the terms *somatic disease* and *mental disorder* should be preserved.

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Lipoma and Occult Spinal Dysraphism

Harun Brkić, Hasan Altumbabić, Mirza Moranjkić

Neurosurgical Department
University Clinical Center of Tuzla

Corresponding author:
Harun Brkić
Neurosurgical Department
University Clinical Center of Tuzla
Trnovac b.b., 75000 Tuzla
Bosnia and Herzegovina
e-mail: brkicharun@yahoo.com

Congenital abnormality, an occult spinal dysraphism with spinal lipoma, is a rare dysraphic spinal abnormality. The syndrome, treatments, outcomes, and current controversies are reviewed.
Occult spinal dysraphism usually is usually manifested without clinical changes, either neurological or local changes. Local cutaneous changes associated with occult spinal dysraphism include midline lumbosacral hypertrichosis, lumbosacral cutaneous hemangiomas, lumbosacral dermal sinus and midline lumbosacral subcutaneous lipoma. Neurological changes in spina bifida occulta and spinal lipoma include local and radicular pain, asymmetric hyporeflexia, spasticity, sensory changes, weakness and bowel/bladder dysfunction. A progressive neurological/urological dysfunction limited to the conus medullaris may also suggest other spinal cord syndromes. Ultrasonography, CT scanning, MR imaging, and plain radiography assist with the localization of the conus medullaris level changes but also the identification of the specific spinal elements affected. Surgical intervention for the asymptomatic lipoma of the conus medullaris has been an area of controversy, primarily due to the paucity of studies in which the natural history of this disorder is researched in detail. Excising cutaneous changes is recommended in case of any esthetic or functional disturbances.

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Introduction

Spinal dysraphism is a term that refers to all forms of developmental abnormalities occurring in the midline of the back - from the skin externally to the vertebral bodies internally (1). Although the true incidence of spinal dysraphism is unknown, authors of some studies have estimated an incidence of 0.05 to 0.25 per 1000 births (2, 3).

The embryonic development includes 50-62 days of postconceptional period. The period between the 18th and 32nd day is very important for the development of the central nervous system. The neural tube is formed during the 18-48 day period (4, 5,

6). Errors during neurulation may lead to various congenital malformations (4). The most common expression is spina bifida in the lumbosacral region. These abnormalities usually involve the lumbosacral spine, although lesions in the cervical and thoracic region may also occur.

Lipomas of the spine are among the most fascinating lesions encountered by the pediatric neurosurgeon. Terminology related to this particular problem and understanding of spinal lipomas may be difficult, because differentiation of the accumulations of fat in the spinal canal is confusing. Lipomas of the lumbar spine are very rare, and they cause symptoms related to mass effect and secondary compressive radiculopathy. Lipomas of the conus medullaris are the most common form of fatty masses in the spine and can be divided into different forms. These lesions are a manifestation of occult spinal dysraphism and a common cause of the tethered cord syndrome (1, 2).

Spinal dysraphism with lipoma may exist in an open form (spina bifida aperta), and in a closed form, (spina bifida occulta). Mechanical traction of the spinal cord and neural structures in the spinal canal may be a cause of progressive symptoms (7). These symptoms could appear after hypoxic damage within the conus medullaris (8). Blood flow improvement has been noted after the spinal cord has been decompressed surgically.

Clinical manifestations, that are associated with other stigmata, include the dysraphic spinal elements, cutaneous stigmata, vertebral anomalies, orthopedic abnormalities (scoliosis and extremity abnormalities), neurological deterioration at the level of the lower spinal cord, including bowel and bladder dysfunction, and anorectal malformations (9, 10). Usually, there are just cosmetic changes without neurological disturbances during pediatric growth.

Occult spinal dysraphism with lipoma is sometimes manifested without local or neurological changes. Most commonly, lipomas are localized extraspinally and they seldom exhibit intraspinal or intradural localization. Extraspinal and extradural forms are usually presented without neurological changes. It is possible for lipoma to grow and make compression on lumbosacral nerves and cause radicular symptoms. Intradural lipoma is usually manifested with neurological changes, causing compression of the conus medullaris elements.

Clinical Features of Lipoma with Spinal Dysraphism

Cutaneous Stigmata

The cutaneous changes associated with occult spinal dysraphism include the midline lumbosacral cutaneous hemangiomas, lumbosacral hypertrichosis, lumbosacral dermal sinus and midline lumbosacral subcutaneous lipoma (11). Extraspinal lipomas in adolescents are very rare because surgery is usually performed at an earlier age (Figure 1-A, B).

Neurological, Orthopedic Changes

Infants born with spina bifida occulta and lipoma are usually neurologically intact; even though progressive neurological deterioration is common and represents a single most important reason why detection and appropriate treatment is important. The authors of many large-scale studies have demonstrated progressive neurological symptoms in patients left surgically untreated (8).

Low-back pain is very unusual in infants and children, but it is felt by adolescents and adults, commonly manifested as a generalized low-back pain and radicular leg pain, which may vary in distribution over time. Local and radicular pain, weakness, sensory changes, and bowel/bladder dysfunction could occur in occult spinal dysraphism (7, 12).

Deformity of extremities and feet is visible in early childhood in some children har-

boring lipomyelomeningoceles rather than spinal lipoma. These changes are often progressive and most commonly detected later in childhood. Asymmetrical foot deformities (typically cavovarus, but occasionally cavovalgus) arise from asymmetrical innervation of feet. Foot-length, leg-length and limb-length discrepancies, limb pain and progressive joint deformities, such as scoliosis, can be seen as well (11, 13, 14).

Anorectal Anomalies

Lipoma and occult spinal dysraphism have been found to be associated with various anorectal and urogenital malformations, albeit rarely. Deterioration of urinary bladder function is common in patients harboring lipomyelomeningocele. The detection of bladder anomalies appears to correlate with the age at which a child is examined and the sensitivity of means by which the patient is evaluated (15, 16).

Figure 1. A Skin tag that resembles a tail and a subcutaneous lipoma are displaced out (15 cm)

Occult Dysraphic Elements

Fatty accumulations within the spinal canal represent lesions associated with spina bifida occulta and take three different forms (17):

1. Cutaneus and subcutaneous lipomas that extend into the spinal canal without extension to subdural neural structures (11).

2. The most common form of abnormality is subcutaneous lipoma within the spinal canal that extends through a defect of the paravertebral muscles, lamina, dura, and pia into the low-lying spinal cord. These cases usually come to clinical attention within the first few months or years of life (18, 19).

3. The intradural lipoma (spinal cord lipoma) is a rare intramedullary lesion that is usually found within the thoracic spinal cord. It is not commonly associated with cutaneous or bone anomalies, and it is often manifested with symptoms of spinal cord compression (20). The fatty filum could involve fatty infiltration of the whole length or part of the terminal filum. The fat within the short,

Figure 1. B Subcutaneous lipoma and a cutaneous hemangioma are shown.

thick filum is discernible by unenhanced CT or MR imaging (21). The occurrence of incidental fat within the terminal filum in the normal adult population has been estimated to be 3.7% in cadaveric studies (22) and 1.5 to 5% in MR imaging studies (22, 23).

Diagnosis

If occult spinal dysraphism is suspected on clinical grounds, the first logical step is to obtain appropriate neuroimaging studies to define the anatomical and pathological features of the lesion. Ultrasonography is a useful modality to apply on an infant suspected of harboring lipomyelomeningocele (24).

Plain x-ray films almost uniformly demonstrate abnormal findings. The most common findings include dorsal midline fusion defects (spina bifida) and a widened spinal canal (25).

Computerized tomography myelography provides an excellent resolution of the anomaly; however, this modality is invasive, and requires exposure to radiation as well as lumbar puncture which can be particularly hazardous in the setting of the low-lying conus (Figure 2) (26).

Magnetic resonance imaging has evolved to become the imaging modality of choice for dysraphic states. Lipomatous tissue demonstrates a high signal on T 1 -weighted MR images and a low signal on T 2 -weighted MR images. Contrast material administration is not necessary (Figure 3) (27).

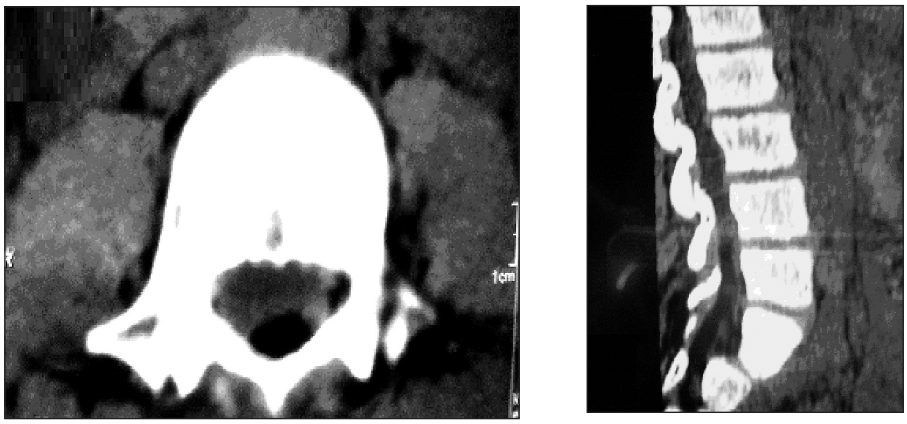

Figure 2. CT lumbosacral region lipoma revealing defect of the lamina and intraspinal lipom

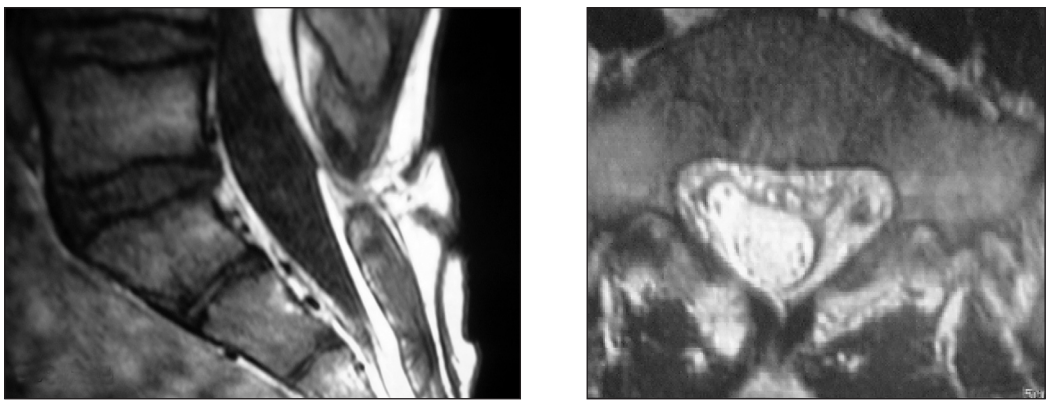

Figure 3. MRI lumbosacral region with spina bifida occulta associated with intradural and extraspinal lipoma

Surgical treatment

Surgical intervention for the asymptomatic lipoma of the spine has been an area of controversy, primarily due to the paucity of studies in which the natural history of this disorder is detailed (7, 28, 29). Many authors have advocated the use of an early prophylactic surgery to prevent deterioration, noting that asymptomatic patients rarely become symptomatic after the surgical procedure and that a minority of symptomatic patients experienced a reversal of their preoperative deficits (7, 30, 31). Other authors have maintained that, in their series of patients, prophylactic untethering may not prevent some deterioration, and, because the natural history of the asymptomatic lipoma of the conus medullaris is not clearly known, prophylactic untethering may not be warranted (29).

The majority of authors propose early prophylactic surgery in patients with asymptomatic lipoma of the conus medullaris due to the low rate of neurological worsening (3-4%), resulting from the surgery but also because of better neurological outcome in a follow-up of the asymptomatic patients as compared with that of symptomatic patients (7, 19, 30, 31). If indicated, surgical intervention for lipoma on the spinal cord or conus medullaris involves intraoperative identification of the tumor (lipoma) lesions, release of the spinal cord, and reconstruction to as normal anatomy as possible.

The carbon dioxide laser has been found to be useful for debulking and dissecting intradural lipoma and reducing blood loss. Intraoperative electromyography or evoked potentials may also be used (7, 32, 33).

Conclusion

The diagnosis of this abnormality is most easily acquired in the setting of clinical findings that are supplemented with neuro-imaging studies. Clinical evidence of the subcutaneous lipoma, including skin changes, orthopedic anomalies, vertebral anomalies, and associated anorectal malformations may suggest spina bifida abnormality. CT scanning, MR imaging, and plain radiography assist with localization of level of the conus medullaris and the identification of specific changes on the lumbar spine. Neurological and urological status may be further investigated by using electromyography, cystometrography, and evoked potential monitoring.

The goal of the spinal cord surgery is to stabilize neurological function. Surgical intervention for lipoma with spinal dysraphism involves intraoperative identification of the defect of lamina, release of the spinal cord, and reconstruction to as normal anatomy as possible. Surgery-related complications include standard anesthesia- related risks, neurological worsening, cerebrospinal fluid leakage, and meningitis. Surgery is indicated for relevant cosmetic or esthetic disturbances.

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115 Years since the First Brain Operation in Bosnia and Herzegovina

Faruk Konjhodžić

Department of Surgery,
Clinical Center of Faculty of Medicine, Sarajevo
University Sarajevo
Bosnia and Herzegovina

Corresponding author:
Faruk Konjhodžić
Koševo 12, 71000 Sarajevo,
Bosnia and Herzegovina

e-mail: akademija@anubih.ba

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The first brain operation in Bosnia and Herzegovina was performed in the Muslim Charity Hospital (Vakufska Bolnica – Vakuf Hospital) in Sarajevo in 1891. In fact, three brain operations were performed in that hospital. All of the three patients operated on had sustained head injuries several months prior to the operation, and subsequently, they suffered from epileptic fits caused by bone fragments in the brain. The operation consisted of craniotomy, removal of the bone fragments, and closure of the dura matter. The epileptic fits ceased in all patients following the operation. The above indicated operations were performed by Dr. Carlo Bayer. The hospital was founded in 1866, and it is generally considered the first modern hospital in Bosnia and Herzegovina

Key words: History of neurosurgery; Bosnia and Herzegovina

Introduction

There were no hospitals in Bosnia and Herzegovina before the year 1866 (1, 2). The first general hospital in Bosnia and Herzegovina was opened on October 8th, 1866 (3, 4). It was founded by a Muslim Charity (Vakuf) and called Vakuf Hospital (Vakufska bolnica), while all the expenses for the hospital facilities and its staff were covered by Ghazi Husref Bey's Vakuf (a Muslim Charity Foundation). The hospital was opened by Sherif Topal Osman Pasha, the last Ottoman Turkish governor of Bosnia. The hospital had 40 beds, with separate wards for males and females, the outpatient unit and pharmacy. Only several months later, the Ottoman military hospital was opened in Sarajevo (5). There were several attending doctors in the Vakuf hospital. One of them was Dr. Joseph Koetschet who was assisted by two Turkish military doctors, namely by Dr. Jammal, and Dr. Nuri, the latter being a surgeon. Topal Osman Pasha sent four younger students to Istanbul and Vienna to study medicine. Two of them had successfully completed their studies. They were Dr. Zarif Skender and Dr. Mehmed Samii Serbic. The other

two students gave up their medical studies; instead, they set up trading companies. Dr. Sebic did not come back to the Vakuf Hospital; instead, he settled down in Tuzla and became the first general practitioner there. Dr. Skender came back to the Vakuf Hospital and practiced there until he died from tuberculosis.

Brain operations performed by Dr Carlo Bayer

Dr. Carlo Bayer was born in Hradec Kralove, Bohemia, in 1850. He joined the Serbian army as a war surgeon in the Serbian-Turkish war in 1876. Once the war was over, he came back to Bohemia where he started working as a doctor of forensic medicine. A year later, he joined the Austrian Navy in the capacity of a ship surgeon and remained on the ship until 1880. In the following years, he changed several positions, including a post of professor of Forensic Medicine in Prague. It was in 1885 when he finally settled down in Sarajevo. He became a chief doctor in the Vakuf Hospital. Dr. Bayer stayed in Bosnia for the rest of his life. After a new hospital had been built and opened in 1894, the Vakuf Hospital was turned into an Asylum for Mental Illnesses. Dr Bayer was appointed head of this institution. He retired in 1911, and died soon afterwards in 1916. Unfortunately, there is no photograph of him.

The first brain operation in Bosnia was preformed in the summer of 1891. The patient was a young male who suffered from epilepsy. He had sustained a head injury seven months earlier, resulting in a wound in the scalp. The wound had healed naturally without any medical intervention, but, however, three weeks after the injury the patient suffered the first epileptic attack. Gradually, fits became increasingly frequent and the patient finally decided to see Dr. Bayer who found "that the parietal bone had been punctured while several small bone fragments penetrated into the brain. The wound healed leaving a small scar. Nevertheless, the patient kept complaining of epileptic seizures which occurred almost every day." Over the next nine months, Dr. Bayer examined the other two patients, both diagnosed with the same condition. He operated on them and during operation he "found small pieces of bone in the brain which he removed and, subsequently, closed the dura" (2).

Dr. Bayer reached the brain by applying the osteoplastic craniotomy; he fixed the lobe by interrupted sutures and put plaster on the head after skin suturing had been done. It was recorded that seizures ceased in all three patients following the operation.

There are no official documents in respect of Dr. Bayer's specialist surgical training. Doubtless, he must have acquired some experience as a war surgeon, but, unfortunately, there is no written record of his operating techniques/ procedures. Hence, we are unaware of either the kind of surgical instruments he used or a method he applied to control bleeding, etc.

Even before Dr. Bayer, there were several Ottoman Turkish military surgeons who performed various operations, including trepanation for extra cerebral hemorrhage, operation of the severely depressed fracture, but none of them had dared carry out the osteoplastic craniotomy or cerebrotomy.

Dr Bayer did the brain surgery shortly after the first craniotomy was performed by F. Durante in 1882, which makes the achievement of the former even more impressive, especially taking into consideration the fact that it was carried out in a provincial hospital with little experience in the field of surgery. The description of the operating procedures is preserved only in his personal papers, because the Vakuf Hospital had no operating protocol.

These pioneering efforts of Dr. Bayer were also the only ones made at the Vakuf Hospital. In 1894 a new General Hospital

also housing a modern surgery department was opened in Sarajevo, The head of surgery department was Dr. Preindelsberger, an experienced surgeon from the General Hospital of Vienna. The old Vakuf Hospital became an asylum for mentally sick patients with Dr. Bauer in charge of it. He never operated again.

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