

Is Adrenal Exhaustion Synonym of Syndrome Burnout at Workplace?

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ABSTRACT

The objective of this study is the assessment of the association of burnout syndrome with adrenal exhaustion specific symptoms and signs among 116 patients who were exposed to violence or mobbing at workplace and who were treated during 2005 to 2008 in Department of Occupational Pathology and Toxicology Tuzla; to detect symptoms and signs of adrenal exhaustion differences between patients who were exposed to act of violence as acute catastrophic event and patients who were long – term exposed to mobbing or chronic distress at workplace. Material and methods: Data of 86 employees who were exposed to mobbing >1 years (chronic distress syndrome) and data of 30 employees who were exposed to act of violence as acute traumatic crisis situation (evaluation in first week after acute stress situation and post control observation 6 months later). Tools for assessment were Clinical examination and Questionnaires: Occupational stress questionnaire (OSQ short version), self – constructed Questionnaire about symptoms and signs of Adrenal exhaustion; self – constructed mobbing questionnaire; and Maslach – Burnout Inventory. Results: The patients expressed their traumatic experiences during exposure to stress more than 1 year (long – term exposure) which were compared with acute stress experiences (mostly high level of stress intensity. Conclusion: when workers constant expose to repeat mobbing behavior or have perception of extended distress reaction after act of violence at workplace they are suffering of Syndrome burnout and clinical picture of adrenal fatigue.

Key words: adrenal exhaustion, emotional exhaustion, syndrome burnout

Introduction

In occupational health research, topics on workplace stress have been identified as a priority¹. Stress is one of the most common words that we use to describe how we feel. Stress involves rapid activation of the body's alarm system which helps people to mobilize their physical resources – an ancient form of reaction to danger^{2,3}. Adrenal exhaustion is also known as adrenal fatigue. It is a modern condition that is associated with overwork and high stress, and it is characterised by a deficiency in the function of the adrenal glands⁴⁻⁷.

Adrenal fatigue is a collection of signs and symptoms, known as a syndrome, which results when the adrenal glands function below the necessary level⁷. Most commonly associated with intense or prolonged stress^{4,5}. If the adrenal glands become exhausted, this creates a

damaging domino effect for hormones. In a case of adrenal fatigue is produced high level of cortisol when adrenal glands cannot adequately meet the demands of stress. They secrete cortisol to keep the body going under long periods of stress. Cortisol is an important hormone in the body, secreted by the adrenal glands and involved in the following functions and more: proper glucose metabolism, regulation of blood pressure, insulin release for blood sugar maintenance, immune function and inflammatory response^{8,9}. Normally, it's present in the body at higher levels in the morning and at its lowest at night. Although in case of adrenal fatigue, cortisol termed as »the stress hormone« because it's also secreted in higher levels during the body's response to stress. In this case cortisol is responsible for several stress – related changes

in the body^{2,3,6,7}. High cortisol levels also lead to lower progesterone. Decreased production of De Hydro Epi Androsterone (DHEA) can cause lower levels of both estrogen or testosterone^{6,7}. This syndrome has been known by many other names throughout the past century, such as adrenal neurasthenia, adrenal apathy and adrenal fatigue^{7–13}. With each increment of reduction in adrenal function, every organ and system in body is more profoundly affected. Changes occur in carbohydrate, protein and fat metabolism, fluid and electrolyte balance, heart and cardiovascular system, and even sex drive as shown in Table 1. Many other alterations take place at the biochemical and cellular levels in response to and to compensate for the decrease in adrenal hormones that occurs with adrenal fatigue. Your body does its best to make up for under – functioning adrenal glands, but it does so at a price^{8–11,14–20}.

The aims of this study are to test association between symptoms and signs of adrenal exhaustion and emotional exhaustion during Burnout syndrome; to assess characteristics of tree dimensions of persons in Burnout Syndrome (the main characteristics fatigue, emotional and physical exhaustion) by Maslach Burnout Inventory and to found the differences between exposure to acute traumatic crisis situations and adrenal fatigue during long term (more than 1 year) exposure to stress at workplace.

Subjects and Methods

A case control study survey was conducted in order to investigate the relationship between individual exposure

to repeat mobbing behaviour more than 1 year or perception of extended stress reaction to act of violence at workplace and symptoms and signs of adrenal exhaustion in patients who are treated in Department of Occupational Pathology and Toxicology, Service of Occupational Health Tuzla in Tuzla Canton, Bosnia and Herzegovina (unique special health care department in Bosnia and Herzegovina at tertiary level; multidisciplinary team work for prevention and verification of occupational injuries and diseases) from 2005 to 2008 year. The study comprised 297 randomly selected patients who were reported that suffered negative health effects of exposure to mobbing behavior or injured with act of violence at workplace. The assessment of health effects and monitoring of exposure to mobbing and violence (duration time and intensity) by clinical examination and adequate questionnaires was confirmed.

We excluded 149 of out 297 participants who met excluding criteria: missed exposure to mobbing or violence at workplace (case of conflicts), diagnosis of past chronic mental disorders, diabetes mellitus, hypothyroidism, renal and hepatic insufficiency, obese patients, pregnant women, patients who took medications like thiazide – diuretics, beta – blockers, corticosteroids, lipids lowering therapy, oral contraceptive and replacement hormonal therapy, as well as patients who consume alcohol and have more than light physical activity. The participation to study was voluntary. We collected data on medication and concomitant diseases from medical records. Thirty two patients did not like participate (the total number was 116 participants).

TABLE 1
PRESENTATION OF DIFFERENT SYMPTOMS AND SIGNS OF REACTION TO ACUTE STRESS AND CHRONIC STRESS BETWEEN GROUPS IN FRAMEWORK OF STRESS THEORY OF HENRY AND STEPHENS⁶

| Two axes theory of Henry & Stephens: hormone | Exposure to act of violence, acute and active stress reaction: (fight flight): adrenalalin | Exposure to mobbing >1 years, chronic distress and passive stress reaction: adrenal fatigue – cortisol |
|--|--|---|
| Memory | Less concentration, difficulties of decision making | Cognitive fatigue: difficulties of concentrating or decision making (→tunnel vision«, making of mistakes, risk taking and accidents |
| Cognitive association | Short term memory difficulties | Hampers learning or/and learning inhibits stress |
| Mood | Positive attitudes, good perception | Negative attitudes, poor perception, memory lapses |
| Drive | Anxiousness, aggressiveness | Irritations, depression, sleep disorders, production errors and near-accidents |
| Libido | Euphoric, active feeling, dynamics | Exhaust, fatigue, apathy |
| Immune-system | Low libido | Suppresses sexual activity |
| Metabolism | Increase number of NK-cells | Decrease number of NK-cells |
| Digestion | Increase blood sugar, increase level of cholesterol, pulse, high blood pressure | Decrease blood sugar, |
| Self-esteem | Indigestion, constipation | Ill-health |
| Concentration | High level | Reduced, loss |

The main research methods were risk assessment (the relationship between exposure to mobbing and act of violence and health effects). A clinical evaluation included medical/ occupational/history, physical exam with three times measures of blood pressure; cholesterol counts, blood sugar level (first pass of the evaluation). Serum total cholesterol was measured in Biochemical Laboratory of Tuzla Health Home from venous blood sample. Serum total cholesterol level was measured in biochemical analyzer »Liza 300 plus«. According to this guideline high cholesterol level was 6.2 mmol/L. Determination of blood glucose level was provided by glucose – meter. Referent level of blood glucose is >6.1 mmol/ L before breakfast. The clinical examination of stress and mobbing exposure health consequences considered: interview with patient (verbal and written word), clinical examinations, and other diagnostic procedures related health outcome, psychological examination, and questionnaires examination (Stress occupational questionnaires (OSQ)¹¹, Questionnaire about mobbing^{12–16,24} (conclude questions about characteristics of exposure with intensity or frequency, types of mobbing behavior) Maslach Burnout Inventory^{17,18}. Logically, the mobbing/ stress measuring design are very complex process and needs to develop special skills in communication with potentially mobbing victims.

Determination of exposure to acute and chronic stress at workplaces

Acute stress is when there is a sudden accident or incident that startles you and your system into the stress mode. Chemicals are released into your body to »defend« you from the threat^{3,20,21}. After the threat subsides, the chemicals stop circulating and your body reverts back to normal via homeostasis. However, when you have an issue that is constant exposure to work – related stress, like long – term exposure to mobbing or other stressors at workplaces, then the chemicals continue to circulate and put your system on constant alert and bombardment. These chemicals can literally destroy your body systems and organs if allowed to continue^{7,13–29}. The chronic exposed to stress group was eighty six employees who were more than 1 year exposed to stress at workplace (domination of mobbing) in various way and intensity. Chronic stress means exposure to work – related factors (stressors), mobbing (bullying), Syndrome Burnout or ill health^{13–19}. Mobbing as a phenomenon of psychological abuse of an employee represents one of the most serious forms of chronic work related stress, which may have permanent consequences for mental and physical health of an individual^{12,14–26}.

According determination of exposure to acute (act of violence) or chronic stress (in this case exposure to mobbing >1 years) at workplace the participants were divided into two groups. There were not significant differences for age, sex and job titles between groups (Table 2).

In last phase of study, to explore Syndrome burnout and related adrenal exhaustion consequences we conduct questionnaire survey. Questionnaires were distributed

during routine procedure of clinical examination of patients who suffered stress at workplace.

Study groups

The chronic exposed to stress group was eighty six employees who were more than 1 year exposed to mobbing at workplace in various way and intensity. Chronic stress means exposure to work – related factors (stressors), mobbing behavior, Syndrome Burnout or Ill health^{13–19}. Mobbing as a phenomenon of psychological abuse of an employee represents one of the most serious forms of chronic work related stress, which may have permanent consequences for mental and physical health of an individual^{14–26}.

The acute high level stress group was 30 employees who suffered acute stress reaction to act of violence (crisis situation as accidents at workplace). Acute traumatic stress reaction or crisis situation at workplace are: robbery at workplace – a sudden, sexual harassment at workplace, threat of violence, life crisis in accidents at workplace and other. A sudden and dramatic event goes thorough four phases: shock, reaction, and mental processing and re – orientation^{13–19}. Another major problem is when employees are provoked by clients, patients, inmates of institutions, visitors and so on. Stress, irritation and suspicion build up conflicts and outbursts^{12,13,18,19,23}. Sexual harassment refers as unwelcome sexually related behaviors, in words and actions that lead to someone feeling humiliated, stressed, or ill at ease²¹.

Questionnaires

Mobbing Questionnaire questionnaire collects demographic (age, sex), and work related information (job title). Finally participants were asked about their experiences of five major categories of mobbing behavior: threat to professional status, threat to personal standing, isolation, overwork and destabilization^{12–16,20}. Threat to personal standing included undermining personal integrity, teasing, verbal threat and threading gestures, damaging to personal possessions. Isolation includes withholding necessary information, freezing out, ignoring or excluding, and unreasonable refusal of applications for leave, training or promotion. Enforced overwork was defined as undue pressure to produce work and setting of impossible deadlines. Destabilization includes claiming credit for ideas, rumors or malicious gossip, undervaluing efforts, removal of areas of responsibility without consultation. The frequency of mobbing behavior as intensity of exposure to mobbing was graduated: never, rarely, sometimes, often, and almost daily. At the last section of questionnaire, participants were asked about the main symptoms of stress and mobbing (feel of: loss of confidence, lack of motivation, loss of self esteem and anger, anxiousness, depressiveness, sleeplessness, fatigue, headache, palpitation/sweating, nausea), extent support from superior, recognized effects of mobbing to personal life, effects of mobbing to performed work tasks²⁰.

The symptoms and signs of adrenal exhaustion questionnaire were recorded using a self constructed ques-

tionnaire developed for this research. The questionnaire about symptoms and signs of adrenal fatigue asks participants a number of questions related to their experiences and include: perceived fatigue, loss of concentration, has recently difficulties of concentrating or decision making, decreased sex drive, decreased ability to handle stress, decreased attitude, depression, less tolerance, (see ANEX, Table 5)¹⁻⁷. The answer on each question was created by Yes, No or I am not sure.

Maslach Burnout Inventory were used to measure burnout among employees who were exposed to stress at workplace we chose Maslach Burnout Inventory (MBI) for human service survey (18) translated to BH language to. This questionnaires includes 22 items to be respond 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)¹⁷. Psychometric characteristics of the MBI have been assessed in different socio – psychological contexts with quite acceptable results (18–20) with regard to its reliability. Coefficient Cronbach’s α of 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. The Cronbach’s α 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 ≥ 37 indicate high level of

PA and low level of burnout. These definitions of cut – off scores PA, EE and DP used on the frame of results of previous studies by other authors¹⁷⁻¹⁸.

Statistical Analysis

Statistical analyses were conducted using Statistical Package for Social Sciences (SPSS) version 12.0. Differences between groups and subgroups using non – parametric χ^2 -test and Mann-Whitney test was confirmed. Correlation analyses using parametric Pearson coefficient and Spearman’s coefficient and ANOVA, was carried out to identify statistical relationships between the scales of the four questionnaires and other basic data collected. The 95% of confidence intervals report proportions to aid comparison with other study data. Linear logistic regression ANOVA test was performed for tree dimension variables of Burnout syndrome as main predictors and demographic data as independent variables (SPSS Inc., Chicago, IL, USA).

Results

Characteristics of survey respondents

Among 116 participants included in the analysis, there were 84 (72.4%) women. The median age of participants was 40 years (range: 24–55). Eighty – six participants were exposed to mobbing behavior at work place more than 1 year and they were suffered Syndrome burnout too. Thirty two participants suffered acute crisis situation (exposure to act of violence as accident at workplace), 10 of them were men. Teaching staff and secretar-

TABLE 2
PRESENTATION OF INDIVIDUAL CHARACTERISTICS OF STUDY PARTICIPANTS BETWEEN GROUPS RELATED TO EXPOSURE TO MOBBING OR ACT OF VIOLENCE

| Individual characteristics of participants (N=116) | No of respondents (%) | | p* |
|--|---------------------------------|--|-------|
| | Exposed to act of violence N=30 | Exposed to chronic mobbing behavior N=86 | |
| Gender: | | | |
| Men | 10 (33.3) | 22 (25.6) | 0.448 |
| Women | 20 (66.7) | 64 (74.4) | |
| Job title: | | | |
| Secretary | 7 (23.3) | 26 (30.2) | 0.111 |
| Teaching staff | 9 (30.0) | 21 (24.4) | |
| Manager | 1 (3.3) | 3 (3.5) | |
| Health workers | 5 (16.7) | 28 (32.6) | |
| Others | 8 (26.7) | 8 (9.3) | |
| Age | | | |
| 30–40 | 12 (39.9) | 52 (60.4) | 0.105 |
| 41–50 | 7 (23.4) | 22 (25.6) | |
| >51 | 11 (36.7) | 12 (14.0) | |

* χ^2 test

ies together with health workers were vulnerable groups for stress (see Table 2).

Patients who are exposed to chronic stress suffered all symptoms associated with adrenal exhaustion (range from 45 to 95%) as shown in Table 3. According symptoms and signs of adrenal fatigue there were 82 of 86 (95.3%) who have difficulties of concentrating or decision

making; 54 of 85 (62.8%) who have trouble of learning for professional development; 66 of 86 (76.6%) who have negative attitudes and poor perception; 67/77.9% who have reduced or loss self esteem; 82 of 86 (95.3) who have apathy and exhaustion and 67 of 86 (77.9) who suffer depression among group of participants who were exposed to chronic stress at workplace (Table 3). We were think-

TABLE 3
PRESENTATION OF SYMPTOMS AND SIGNS OF PASSIVE STRESS REACTION (ADRENAL EXHAUSTION AND DOMINATION OF CORTISOL ACTIVATION) AMONG PARICIPANTS WHO WERE EXPOSED TO MOBBING >1 YEAR (n=86)

| Symptoms and signs of adrenal exhaustion/ | No of respondents (%) | | | p* |
|--|-----------------------|-----------|----------------|-------|
| | Exist | Not exist | Not sure exist | |
| Have you recently difficulties of concentrating or decision making | 82 (95.3) | 1 (1.1) | 3 (3.6) | 0.001 |
| Have you felt depressed | 67 (77.9) | 6 (7.2) | 13 (15.1) | 0.001 |
| Could not you learning new or could not do your tasks | 54 (62.8) | 19 (22.1) | 13 (15.1) | 0.001 |
| Have you recently negative attitude and poor perception | 66 (76.6) | 6 (7.2) | 14 (16.2) | 0.001 |
| Have you recently exhaustion, fatigued or apathy | 82 (95.3) | 1 (1.1) | 3 (3.6) | 0.001 |
| Reduced or loss self-esteem | 67 (77.9) | 6 (7.2) | 13 (15.1) | 0.001 |
| Have you recently sleep disorders | 67 (77.9) | 6 (7.2) | 13 (15.1) | 0.001 |
| Have you been feeling anxiety and irritations | 82 (95.3) | 1 (1.1) | 3 (3.6) | 0.001 |
| Have you been getting panicky for no good reason | 79 (92.0) | 1 (1.1) | 6 (6.9) | 0.001 |
| Have you suppression of sexual activity | 43 (50.0) | 12 (14) | 31 (36) | 0.004 |
| Do you making mistake at workplace | 50 (58.1) | 19 (22.1) | 17 (19.7) | 0.010 |
| Have you recently reduced or loss of concentration | 67 (77.9) | 6 (7.2) | 13 (15.1) | 0.001 |
| Have you felt constantly under strain | 83 (95.3) | 1 (1.1) | 2 (3.6) | 0.001 |
| Have you felt you are ill | 69 (80.2) | 9 (10.5) | 8 (9.3) | 0.001 |

* χ^2 -test

TABLE 4
PRESENTATION OF THE ASSESSMENT OF THE LEVEL OF TREE DIMENSIONS OF SYNDROME BURNOUT BETWEEN GROUPS; AND THE ASSESSMENT OF THE LEVEL OF TREE DIMENSIONS OF SYNDROME BURNOUT AMONG GROUP EXPOSED TO ACT VIOLENCE IN TWO TIME INTERVALS: IN NEARLY TIME OF EVENT and LATER 6 MONTHS

| Dimension of MBI | No. of respondents (%) | | | p* |
|-------------------------------|---|---|--|-------|
| | Exposed to mobbing more than 1 years (N=86) | Exposed to act of violence in nearly time of event (N=32) | Exposed to act of violence later 6 months (N=32) | |
| Personal accomplishment (PA): | | | | |
| High level | 14 (16.3) | 26 (86.7) | 11 (36.7) | 0.002 |
| Moderate level | 27 (31.4) | 4 (13.3) | 14 (46.7) | 0.001 |
| Low level | 45 (52.3) | 0 (0) | 5 (16.7) | 0.001 |
| Emotional exhaustion (EE): | | | | |
| High level | 85 (98.8) | 3 (10.0) | 30 (100) | 0.001 |
| Moderate level | 1 (1.2) | 10 (33.3) | 0 (0) | 0.002 |
| Low level | 0 (0) | 17 (56.7) | 0 (0) | 0.001 |
| Depersonalization (DP): | | | | |
| High level | 81 (94.2) | 13 (43.3) | 23 (76.7) | 0.001 |
| Moderate level | 4 (4.6) | 17 (47.0) | 7 (23.3) | 0.004 |
| Low level | 1 (1.2) | 0 (0) | 0 (0) | 0.272 |

* Mann-Whitney test

TABLE 5
PRESENTATION OF SIGNS AND SYMPTOMS OF ADRENAL EXHAUSTION QUESTIONNAIRE: CONTEXTUAL AND PERCEPTUAL ITEMS

| No. | Hypotheses | Exist | Not exist | Not sure exist |
|-----|---|-------|-----------|----------------|
| 1. | Have you recently difficulties of concentrating or decision making. | 1 | 2 | 3 |
| 2. | Have you difficulty in staying asleep once you are off | 1 | 2 | 3 |
| 3. | Have you felt depressed | 1 | 2 | 3 |
| 4. | Could not you learning new or could not do your tasks | 1 | 2 | 3 |
| 5. | Have you recently negative attitude and poor perception | 1 | 2 | 3 |
| 6. | Have you recently exhaustion, fatigued or apathy | 1 | 2 | 3 |
| 7. | Reduced or loss self-esteem | 1 | 2 | 3 |
| 8. | Have you recently sleep disorders | 1 | 2 | 3 |
| 9. | Have you been feeling anxiety and irritations | 1 | 2 | 3 |
| 10. | Have you been getting scared or panicky for no good reason | 1 | 2 | 3 |
| 11. | Have you suppression of sexual activity | 1 | 2 | 3 |
| 12. | Do you making mistake at workplace | 1 | 2 | 3 |
| 13. | Have you recently reduced or loss of concentration | 1 | 2 | 3 |
| 14. | Have you felt constantly under strain | 1 | 2 | 3 |
| 15. | Have you felt you are ill | 1 | 2 | 3 |

ing about work ability of them. The mean concentration of blood glucoses among subjects who were exposed to acute crisis situation were 6.3±1.7 mmol/L; serum cholesterol level 6.0±0.7 mmol/L; WAI 32.5±8.5; the mean concentration of blood glucoses among subjects who exposed to chronic, passive stress were 5.3±0.8 mmol/L; serum cholesterol level 6.3±0.9 mmol/L; WAI 18.6±6.8 (data not presented). There were significant differences for WAI between groups (p=0.040).

Table 4 present results of the Maslach Burnout Inventory scales for the groups and or groups of participants with crisis situation two times separately). The mean burnout scores were (emotional exhaustion 17.6.0±6.55 (SD), range: 10–24; depersonalization 15.2±6.9 (SD), range: 2–29; and personal accomplishment 34.6±6.8 (SD), range: 5–48; data not showed). Our sample shows that 99% of the respondents suffered from high level of emotional exhaustion. High level of depersonalization (reduced or loss self esteem, decrease of motivation) was presented among both groups among 94.2% participants who are exposed to chronic stress and among participants who were suffered acute traumatic stress 76.7%. Lack of personal accomplishment was found particularly among 52.3% participants who were long term exposed to stress (Table 4). Among women found more frequent emotional exhaustion (64 vs. 20; p=0.001).

We found significantly individual perception correlation for emotional exhaustion (EE) and depersonalization (DP), between two time intervals (nearly time of event and later 6 months) among participants with experience of acute stress reaction, but not for personal accomplishment (for EE vs. EE1, factor correlation=0.396, p=0.030; for DP vs. DP1, factor correlation =0.368, p=0.045; for PA vs. PA1, factor correlation =-0.150, p=0.430; data not presented). The perception of personal

accomplishment long time remains on high level during exposure to stress at workplace. In this way, results found in second step that predictors for decrease of personal accomplishment was only age (ANOVA Odds ratio, OR=0.053, β0=25.6; β1=0.16; P=0.020; data not presented).

When personal accomplishment, emotional exhaustion and depersonalization entered as dependent variables in three multiple regression analyses in a hierarchical approach results provided selection of predictors out of selected pool of potential factors.

Discussion

Thousands of people suffer from constant fatigue that is not relieved by rest and sleep. This is the main symptom of adrenal weakness or adrenal burnout syndrome. When lead combinations of lack of demands and lack of control at workplace^{2,3}, in some time in human body lead cortisol caused by adrenal fatigue and/or emotional and somatic exhaustion⁵⁻⁷.

The adrenal glands mobilize your body’s responses to every kind of stress (whether it’s physical, emotional, or psychological) through hormones that regulate energy production and storage, immune function, heart rate, muscle tone, and other processes that enable you to cope with the stress. When employee suffers any type of severe repeated or constant stress in his life, his adrenals have to respond to the stress and maintain homeostasis. If his response is inadequate, he is likely to experience some degree of adrenal fatigue. During adrenal fatigue adrenal glands function cannot enough to maintain optimal homeostasis because their output of regulatory hormones has been diminished, usually by over – stimulation. Over – stimulation of adrenals can be caused either

by a very intense single stress, or by chronic or repeated stresses that have a cumulative effect as we found in our results⁶⁻⁸. Stress related adrenal fatigue often plays a role in many health conditions, such as frequent infections, chemical sensitivities, allergies, autoimmune diseases like fibromyalgia and rheumatoid arthritis, menopause and pre – menstrual syndrome (PMS), thyroid function imbalances, chronic fatigue syndrome, low libido, chronic anxiety, and mild depression. The processes that take place in any chronic disease from arthritis to cancer place demands on your adrenal glands^{5,8}. Small increases of cortisol in exposure to acute stress middle or low level of intensity have some positive effects: a quick burst of energy for survival reasons, heightened memory functions, a burst of increased immunity, lower sensitivity to pain and helps maintain homeostasis in the body.

Unfortunately, in our current high – stress work – related culture, the body's stress response is activated so often that the body doesn't always have a chance to return to normal, resulting in a state of chronic stress. Higher and more prolonged levels of cortisol in the bloodstream (like those associated with chronic long term exposure to stress >1 years and long term reaction to exposure to crisis situation found in our study too, to have negative effects, such as: impaired cognitive performance, suppressed thyroid function, blood sugar imbalances such as hyperglycemia and metabolic syndrome, decreased bone density, decrease in muscle tissue, higher blood pressure, lowered immunity and inflammatory responses in the body, slowed wound healing, and other health consequences. Some of the health problems associated with increased stomach fat are heart attacks, strokes, the development of, higher levels of »bad« cholesterol (LDL) and lower levels of »good« cholesterol (HDL), which can lead to other health problems! Cortisol secretion varies among individuals. People are biologically 'wired' to react differently to stress. One person may secrete higher levels of cortisol than another in the same situation. The evolution of the concept is not linear. It has been enriched by recent neurobiological – neuroendocrinological discoveries and also by behavioral – cognitive sciences^{3,16-18}.

What is the killer: hormone or situation? Stress has an implicit: it implies alteration of a theoretical balance or equilibrium within physiological systems, and it seems to characterize a process leading to disease. Large individual differences exist in the way to react to a stressor. Psychological and cognitive determinants are central for the course of the process. The homeostasis concept is not⁷ useful anymore and has been replaced by the more accurate and flexible concept of allostasis. The physiological hormonal and neural bases of this process are now identified. New perspectives identify stressors, chronic or not, to be a source of vulnerabilities through epigenetic mechanisms and a series of behavioral disorders characteristic of our modern civilizations. Stress related ill – health is due to a prolonged imbalance between the utilization and the reconstruction of mental and physical resources⁹⁻¹². Allostatic load is a key concept in this con-

text. This involves a disturbance to the body's system for energy mobilization: there is an imbalance between constructive and destructive forces. This may be a high degree of mobilization even in a state of rest. The shut down functions does not work, and it is difficult to mobilize energy again when this is required. It may also be that the energy level is extremely low in a state of rest, and that the capacity of the individual to mobilize when needed is lacking. Quantitative overload is a normal and common stress reaction. This may involve tasks that are not particularly difficult per se, but which occur under time pressure, which hinders recuperation. It may also involve recurrent overtime working that reduces the time for recovery. Prolonged periods of work and long working days call for a longer recuperation period than is permitted by a »normal« day or weekly rest period. Qualitative overload we meet when an individual having tasks that are too difficult in relation to his/her education, training and experience. Moving up a gear, e.g. experiencing worry and anxiety, or making mental preparations, prior to a demanding or treating situation^{13,18,19,23}. Emotional exhaustion has been known by many other names throughout the past century, such as adrenal neurasthenia, adrenal apathy and adrenal fatigue. Although it affects millions of people in the world but conventional medicine does not yet recognize it as a distinct syndrome⁷⁻¹¹.

Burnout syndrome and exhaustion processes seem to be characterized by the following phases: emotional fatigue, cognitive reactions and fatigue, physical fatigue and ill – health, social reactions and existential fatigue. Emotional fatigue can be expressed with dejection, anxiousness and irritability, and reduced empathy, dissatisfaction with work and loss of emotional and intellectual sensitivity and of reaction capacity. Lack of energy, lack of commitment, concentration difficulties, reduced self – esteem, negative attitudes, suspicion of others, distorted sense of time, poor perception, mistakes, tunnel vision, difficulties in gathering ideas together and making sense of information received – all of which means cognitive reactions and fatigue that overall view of the situation gets lost. A feeling of exhaustion, sleep problems, headaches, dizziness and muscular complaints mean physical fatigue and ill – health. Social reactions: restlessness, increase consumption of nicotine or alcohol, isolation from other people, poorer performance, reduces efficiency and greater absence from work. Existential fatigue: disappointment, resignation, lack of interest in relationships, disinclination to go to work, and reduced loyalty^{13,18,30-38}.

A stress reaction involves moving up a gear or a bodily reaction to meet an immediate challenge or danger. The body reacts by mobilizing energy to enable it to take physical action. Mentally, we consider various strategies to overcome or avoid danger. This is normally what we are referring to when we say that we are stressed. The stress hormone, adrenalin, has proved to be a sensitive indicator of mental stress, and thereby also mirrors psychosocial work conditions. The feeling of stress can be brief, but it may also be prolonged – enduring. Time

seems to be a decisive factor with regard to the harmful effects of stress. In the worst case, the experience of stress may become chronic – a permanent state of mind. This hypothesis is in accordance with our results. Stress can come from many different places and be short – lived or long – lasting. It is the duration time of predominant hormone from adrenalin to chronic hypercortisolism. Both situations can kill. What is the killer: hormone or situation^{18–30,38?}

An important limitation of our study was the generalizability of our findings, as symptom and signs of adrenal fatigue without measuring level of cortisol. Another limitation is assessment based on self – reported rating scales which raises the issue of measurement error.

Conclusion

Modern working life has given us new stressors and threats that are increasingly symbolic, and which, as a

result, cannot be handled in concrete terms as compared with age an age when we had to tussle with wild animals or flee from danger. On our opinion there are no differences between following synonyms: adrenal exhaustion, emotional and somatic exhaustion, fatigue, adrenal fatigue or burnout (burn – out) syndrome in cases of long – term exposure to stress at workplace or exposure to crisis situation – high level of stress at workplace. Adrenal exhaustion or effects of exposure to repeated, persistent stress, burnout syndrome or adrenal fatigue is a quiet health epidemic which is becoming more and more common. In fact, that adrenal exhaustion is an underlying factor in all illnesses. We are now sure that we have answer to questions is adrenal exhaustion synonym with emotional exhaustion. It is important to known that acute stress at workplace often presents acute incidences/ injures at workplace (violence act of sexual harassment or physical attack). Adrenal Exhaustion is a quiet health epidemic which is becoming more and more common.

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ADRENALINSKO ISCRPLJENJE KAO SINONIM ZA SINDROM IZGARANJA NA RADNOM MJESTU?

S A Ž E T A K

Cilj ovog istraživanja je procjena povezanosti sindroma izgaranja sa simptomima adrenalinske iscrpljenosti u 116 pacijenata koji su bili izloženi nasilju i mobingu na radnom mjestu, a koji su bili liječeni od 2005. do 2008. godine u Zavodu za profesionalnu patologiju i toksikologiju u Tuzli; otkriti razlike u očitovanju simptoma i znaka adrenalinske iscrpljenosti između pacijenata koji su bili izloženi činu nasilja, odnosno akutnom traumatskom događaju i pacijenata koji su bili dugotrajno izloženi mobing ponašanjima odnosno kroničnom stresu na radu. Podaci 86 zaposlenika koji su bili izloženi mobingu >1 godinu (kronični distress – sindrom) i podatke od 30 zaposlenika koji su bili izloženi činu nasilja kao akutne traumatske krizne situacije (u prvom tjednu akutne stresne situacije i poslije kontrolne evaluacije 6 mjeseci kasnije). Alati za procjenu bile su klinički pregled i upitnici. Upitnik o stresu na radu (OSQ – kraća verzija), samodizajniran upitnik o simptomima i znacima adrenalinske iscrpljenosti, samodizajniran upitnik o mobingu i Maslach – Burnout Inventory za sindrom sagorijevanja. Pacijenti koji su bili izloženi mobingu >1 godinu (dugoročna izloženost) su izražavali simptome adrenalinske iscrpljenosti za razliku od pacijenata s iskustvom izloženosti akutnoj stresnoj situaciji (uglavnom visokoj razini stresa). Kad su radnici kronično, kontinuirano i ponavljano izloženi mobingu ili imaju percepciju produžene reakcije na stres poslije izloženosti činu nasilja kao akutnoj stresnoj situaciji trpe sindrom sagorijevanja i izražavaju kliničku sliku adrenalinskog iscrpljenja.