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#### Резюме

#### ЗАЛЕЖНІСТЬ НЕРВОВО-ПСИХІЧНИХ ФУНКЦІЙ І СТАНУ ВЕГЕТАТИВНОЇ НЕРВОВОЇ СИСТЕМИ ВІД ХАРАКТЕРУ ХАРЧУВАННЯ

Любчак М.П.

На 180 курсантах одного з вищих військових учбових закладів вивчена залежність ряду фізіологічних показників вегетативної нервової системи і нервово-психічних функцій від характеру харчування. Встановлено погіршення цих показників на фоні фактичного харчування, незбалансованого по найважливішим нутрієнтам, у тому числі білкам, жирам, вуглеводам, вітамінам і мінеральним речовинам. Встановлена можливість нормалі-

зації фізіологічних характеристик вегетативної нервової системи і деяких нервово-психічних функцій шляхом корекції харчування соєвим білково-жировим збагачувачем (СБЖО) і багатим біогенними стимуляторами джерелом адаптагенів – Біотритом-С, розробленими під керівництвом професора Левицького А.П.

#### Summary

#### DEPENDENCE OF NEURO-PSYCHICAL FUNCTIONS AND NERVOUS SYSTEM STATE ON THE NUTRITION TYPE

Lyubchak M.P.

A dependence of sequence of physiological indexes of vegetative nervous system and nervo-psychical functions on the nature of nutrition was studied on 180 cadets of one of the military institutions of higher education. There was discovered worsening of these indexes against the background of existing nutrition, which wasn't balanced according to the most important nutrients, such as proteins, fats, carbohydrates, vitamins and mineral substances. There was determined possibility of normalization of physiological indexes of vegetative nervous system and of some nervo-psychical functions by means of correction of nutrition with use of soya protein-fat concentrate (SPFC) and rich with biogenous stimulators source of adaptagens – Biotrit-C, which was developed under supervision of prof. Levitskiy A.P.

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#### THE INCIDENCE OF DISEASES AND TRAUMAS IN A WARFARE ZONE ON THE EXAMPLE OF U.S. ARMY SOLDIERS SERVING IN THE MULTINATIONAL DIVISION CENTRAL SOUTH IN IRAQ

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#### Introduction

Many environmental factors influence the incidence of diseases and traumas in a warfare zone, in the hot climate. The most

important ones include high temperature and air humidity, high twenty-four-hour changes of temperature (1), cultural differences of the region and its people (2), low sanitary

conditions and military actions (3). High temperature and air humidity cause thermoregulation disturbances, intensification of chronic diseases and clinical symptoms of diseases asymptomatic until then (1,4). Cultural differences of the region and its people and serving in a warfare zone cause alienation, stress, overusing of alcohol and drugs as well as traumas (5,6). Hostilities in the hot climate, low sanitary and epidemiological conditions of the area lead to an increased incidence of gastrointestinal tract diseases (7). Iraq, being a place of multinational stabilization forces' activities, is the place of the most dangerous missions in the world nowadays, where the probability of the loss of health or life is extremely high. Riots among Iraqi civilians break out every day, soldiers of the coalition forces are wounded or killed in ambushes.

The aim of the present article has been to analyse the incidence of diseases and traumas in the population of military personnel on the example of the U.S. Army Military Police (MP) company soldiers serving in the Multinational Division Central South (MND CS) in Iraq. This work is also an attempt of itemizing the factors which influence diseases and traumas in the population examined.

### **Subjects and Methods**

The epidemiological analysis of the diseases and traumas in the population of U.S. Army MP Coy soldiers serving in MND CS in Iraq was based on hospital records, cards of out-patients' charts as well as archival and current medical documentation from the first, second, and third levels of medical evacuation (according to NATO procedures). The medical documentation from 1<sup>st</sup> April 2003 to 29<sup>th</sup> February 2004 was taken from 216 patients of American nationality, with different diseases and traumas of organs and systems, treated in the Combat Support Hospital in Baghdad (3<sup>rd</sup> level), the Field Hospital in Karbala (2<sup>nd</sup>+ level) and on the 1<sup>st</sup> level in military bases in Kuwait (1<sup>st</sup> – 22<sup>nd</sup> April 2003) and in Iraq (22<sup>nd</sup> April – 25<sup>th</sup> September 2003 in Al-Kut, 25<sup>th</sup> September 2003 – 29<sup>th</sup> February 2004 in

Karbala). Organization and tasks of medical evacuation levels in Operation Iraqi Freedom, in the Multinational Division Central South look as follows.

First aid medical care and treatment of sick and injured personnel on the 1<sup>st</sup> level is an every unit responsibility (8). In U.S MP Coy in MND CS medical care was provided by 3 medics (non-commissioned officers). The 2<sup>nd</sup> level is a brigade responsibility. The 30-bed Polish Field Hospital in Karbala was expected to give the qualified medical aid to the wounded and ill soldiers of coalition forces and civilian local population. The basic tasks its medical unit were medical care in urgent situation, stationary treatment of wounded and ill soldiers, to whom the return to service was considered (to 7 days), ambulatory treatment within internal medicine, general and casualty surgery, in other fields of medicine (ophthalmological, dermatological, psychiatrist & psychological service, dental care, laboratory and X-ray diagnostic), preparation for further evacuation, and MEDEVAC (Medical Evacuation) duty (9). The field hospital provided treatment of Iraqi civilians as a humanitarian assistance. The 2<sup>nd</sup>+ level in Karbala consisted of the sick call (admission room, dermatologist', ophthalmologist', internist', psychiatrist', surgical' & psychologist' office, X-ray, morgue), the surgical team (surgical theatre for 2 surgical table and intensive care unit for 4 beds), internal and surgical ward (20 beds), isolation ward (6 beds), laboratory, dental clinic, evacuation team, psychological team, and pharmacy (10).

Patient is not usually treated in MND CS medical facilities for period longer than 3 days in 1<sup>st</sup> level, no longer than 7 days in 2<sup>nd</sup> level or in 3<sup>rd</sup> level for more than 21 days. Patient required treatment or convalescence and/or rehabilitation exceeding a total of 21 days is evacuated to his home country. In cases of major surgery or special treatment beyond contingent capability is required, patient ought to be send to 3<sup>rd</sup> level facility. For MND CS, 3<sup>rd</sup> level is supported by U.S. Combat Support Hospital (CSH) in Baghdad

(8). CSH provides hospitalization and surgical services for critically wounded (battle and non-battle injuries) and ill patients. 3<sup>rd</sup> level provides urgent and routine care through the hospital's clinics to all coalition forces soldiers from the combined joint task force area in Iraq.

The article presents a complete research study, i. e., every U.S. Army MP Coy soldier with two hundred and sixteen serving in MND CS from 1<sup>st</sup> April 2003 to 29<sup>th</sup> February 2004 was examined in analyzed period. The examination allowed the description of the incidence and structure of diseases and traumas, the morbidity of military population according to rank and age. Privates made up 37.0% of the group examined, corporals and specialists – 28.2%, sergeants – 31.9% and commissioned officers – 2.8%. The population studied can be divided into the following age-groups: >20 years of age (11.1%), between 21 and 25 (49.5%), 26-30 (20.8%), 31-35 (9.3%), 36-40 (7.9%), 41-45 (1.4%). Changes on a trust level  $P < 0.05$  were considered significant.

### Results

There were 632 cases of diseases and traumas reported in the U.S. Army MP Coy soldiers in the period analysed. Out of these, 544 cases were treated in out-patients' clinics (463 cases – 1<sup>st</sup> level, 74 – 2<sup>nd</sup> level, 7 – 3<sup>rd</sup> level), 19 cases were operated on the 2<sup>nd</sup> (10 cases) and 3<sup>rd</sup> level (9 cases) of medical evacuation and 69 cases were hospitalised in an internal or surgical ward of the 2<sup>nd</sup> (38 cases) and 3<sup>rd</sup> level (31 cases) of medical evacuation (non-surgical treatment).

Seventeen soldiers of the company were not treated (no pathological symptoms) in the period analysed (7.9% of all the unit personnel).

Twenty soldiers were repatriated to the United States for medical reasons (9.3% of all the unit soldiers). The main causes of premature going back home were:

- 7 traumas (5 gunshot/shrapnel wounds, 1 fracture, 1 sprained knee),

- 4 psychiatric disorders (2 neuroses, 2 adaptation disorders),
- 2 parasitic diseases (leishmaniasis),
- 2 urogenital diseases (1 epididimitis, 1 glomerulonephritis),
- 5 others (acute urticaria, pneumonia, peptic ulcer, radiculosis, heat exhaustion).

As the result of sustaining traumas (gunshot wounds), two soldiers of the company died (killed in hostile fire) during military operations in Iraq.

When the distribution among ranks is analyzed, the incidence of diseases and traumas was the highest in privates (43.5%), which was mainly related to the fact that they constituted the most numerous group of soldiers in the unit examined (privates – 37%; corporals/specialists – 28.2%; sergeants – 32%; officers – 2.8%). The incidence of diseases and traumas according to the age was the highest in the age group of 21-25-year-old (51.1%), which was also connected with the highest number of soldiers from this age group in the unit examined (>20-year-old – 11.1%; 21-25 – 49.5%; 26-30 – 20.8%; 31-35 – 9.3%; 36-40 – 7.9%, <40 – 1.4%).

The main causes of morbidity among the American soldiers were gastrointestinal tract diseases (36.8%).

The incidence rate of gastrointestinal tract diseases was the highest in April 2003 (30.5% of cases), in the beginning of the U.S. Army soldiers military service in the Middle East.

The main causes of patients' treatment were acute gastrointestinal disorders with typical symptoms (vomiting, nausea, diarrhea, typically rapid onset and recovery usually in fewer than 3 days).

The second cause of morbidity were traumas.

No cases of sexually transmitted diseases occurred in the analyzed period of time. There were 2 cases of parasitic diseases (cutaneous leishmaniasis) among soldiers serving in the Wasit province.

### Discussion

One of the most severe health problems among American soldiers serving in Iraq are acute gastrointestinal disorders, what is related to a low level of sanitary conditions in the destroyed areas of hostilities zone and failing to comply with personal hygiene, food and accommodation rules (11). Travelers from sanitized, developed countries are, in a sense, immunologically naive "children", who are suddenly transported to an endemic area of infection where they are highly susceptible to local pathogens (12, 13). During the Operation Desert Shield, when military personnel were rapidly deployed to the Middle East, the U.S. military experienced high rates of diarrheal disease due to bacterial and viral entero-pathogens (14). Strict sanitation and fly control could significantly reduce the risk of gastrointestinal infections (15). Excellent example of appropriate preventive measures taken by health service during hostilities was the homeland war in Croatia in 1991-92. Owing to permanent sanitary controls, mass vaccinations, registration of sick and carriers, in the territory of the whole country there was only one outbreak of food- and water-borne disease (typhoid fever, 21 cases) (16). The most nagging health problem of 40-50% soldiers of military missions, serving in the hot climate conditions have become bacterial, viral and protozoal diarrheas (7). The spread of diarrheal symptoms in the mission soldiers is directly related to a high percentage of carriers of the pathological strains of intestinal microorganisms in the native population (2). It is estimated that 5 million people in Iraq (20% of the population) are at risk of having no access to safe water and sanitation, and that 500 000 m<sup>3</sup> of raw sewage is dumped every day directly into fresh water bodies without any cleaning pre-processing. The access to safe water is dramatically low especially in rural areas (41% in 2002) (17). Transmission of enteric pathogens occurs also through fecally contaminated food. Foods that are not

cooked or peeled, foods obtained from roadside vendors, or foods kept unrefrigerated for long periods of time are of the highest risk (12). The most common pathogen causing diarrhea is enterotoxigenic *Escherichia coli* (30-70% of all cases). Strains of *E. coli* were responsible for 50% of acute gastrointestinal tract disorders which were treated among Polish soldiers in the Field Hospital in Iraq (2+ level), in the period October 2003 – March 2004 (18). The dangerous infectious disease in Iraq, which poses serious epidemiological threat, is leishmaniasis (transmitted by arthropods). By the end of March 2004, 653 cases of cutaneous leishmaniasis among U.S. Army soldiers serving in Iraq were seen at the Walter Reed Army Medical Center and infectious diseases wards of hospitals in the United States. (19). Increase of disease incidence during Iraqi Freedom Operation was associated with arrival of American soldiers during the peak season for sand flies (vectors of the disease), and long duty of troops in Iraq (20). According to the U.S. data, it was the largest outbreak of leishmaniasis among American troops in the history of the military since World War II (21). The own research findings showed that sexually transmitted diseases (STDs) had not caused an epidemiological danger in the population studied. During war the incidence rate of STDs is usually a few times higher than in peacetime (22). A particularly high incidence of STDs is observed in the military missions in South-East Asia, where a very easy access to sexual services offered by prostitutes, a great many of whom are carriers of different kinds of venereal diseases (23). The situation in the Middle East military missions is completely different. Being deployed in the Arab territory with Muslim majority, with their wide range of bans and social norms characteristic of the Arab world, makes the access to the market of sexual services very limited. This results in a low incidence rate which, unlike other diseases characteristic of the hot climate and military zone, has no epidemiological importance (23).



A particularly harmful element involved in serving in military missions is stress connected with performing tasks, especially during military clashes in the mission area (24). Stress is also caused by other factors, such as different climatic conditions, long-lasting separation from family, awareness of existing threats from the local fauna and flora (25). Official dependences (conflicts between superiors and subordinates, impossibility to manage the duties) and non-official dependences (differences of age, education, outlook) prevailing in mission community also seem to be stressful factors (26). In local military conflicts, the percentage of combat stress reaction reached 20-25% in the population of the fighting sides. 90% of the affected soldiers usually come back to the operational status very fast (27). The high percentage of psychiatric diseases and disorders was observed in 1992-1993, during UNTAC peace mission in Cambodia. About 50% of the population of the Dutch contingent suffered from mental problems in the mission area, and only 19% of the questioned Dutch soldiers reported complete retreat of these problems after home-coming (28). Among U.S. MP Coy soldiers serving in MND CS in Iraq only 1.8% of the unit troopers were repatriated to the United States because of psychiatric disorders. Traumas were another health problem which resulted in the absence of American MP Coy soldiers from their duty in Iraq. Battle and non-battle injuries were the cause of repatriation to the United States of 3.2% of all unit troopers. According to German authors, the most common injuries caused by traumas during the warfare in the peace missions area are gunshot wounds from firearms (mainly AK47 Kalashnikov), and shrapnel wounds from shells and antipersonnel mines (29). In every conflict the U.S. has been involved in, 20% of all hospital admissions have been noted as combat injuries (15). Traumatic profile is also a serious health problem among soldiers of other nationalities serving in hostilities zone. Battle and non-battle injuries posed 35.8%

of all diseases and traumas treated among Polish soldiers in the Field Hospital in Iraq (MND CS, 2+ level), in the period October 2003 – March 2004 (18). According to some authors, the killed-in-action rates of combat troops range from 0.2 to 1.35% (30). During military operations in Iraq 0.9% U.S. Army MP Coy soldiers serving in MND CS were killed. Diseases and traumas which occurred among American troopers had not limited the combat capacity of the unit in the period analyzed.

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**Резюме**

СЛУЧАИ ЗАБОЛЕВАНИЙ И РАНЕНИЙ В ГОРЯЧЕЙ ТОЧКЕ НА ПРИМЕРЕ АРМИИ США В СОСТАВЕ МНОГОНАЦИОНАЛЬНОГО ДИВИЗИОНА НА ЮГЕ ИРАКА

*Кристоф Корженевски*

Статья посвящена результатам исследования заболеваний и травм, зарегистрированных у военнослужащих армии США в составе Многонационального дивизиона на юге Ирака. Анализ основывался на медицинской документации о пациентах, обращавшихся за медицинской помощью первой, второй и третьей степени (в соответствии с процедурами НАТО) с апреля 2003 по февраль 2004 г. Исследования показали, что на первом месте у солдат находились острые кишечные заболевания (36,8 %), особенно в начале их службы на Среднем Востоке. Второй причиной, приводящей к эвакуации, были ранения и травмы (переломы и растяжения связок) (17,4%). В проведенном исследовании уточнено, что заболевания передающиеся половым путем не имели эпидемиологического значения в обследованной популяции. Возвращение военнослужащих в США по медицинским показаниям составило 9,3 % от общей численности войск. 0,9 % американских солдат погибли в Ираке (боевые ранения).

**Резюме**

ВИПАДКИ ЗАХВОРЮВАНЬ ТА ПОРАНЕНЬ В ГАРЯЧІЙ ТОЧЦІ НА ПРИКЛАДІ АРМІЇ США У СКЛАДІ БАГАТОНАЦІОНАЛЬНОГО ДИВІЗІОНУ НА ПІВДНІ ІРАКУ

*Кристоф Корженевски*

Стаття присвячена результатам дослідження захворювань та травм, що були зареєстровані у військовослужбовців армії США в складі багатонаціонального дивізіону на півдні Іраку. Аналіз проведено на підставі медичної документації о пацієнтах, що зверталися за медичною допомогою першого, другого та третього ступеню (у відповідності до процедур НАТО) з квітня 2003 по лютий 2004 р. Дослідження показали, що на першому місці у солдат зходились гострі кишкові розлади (36,8 %), особливо на початку їх служби на Середньому Сході. Другою причиною, що приводила до евакуації, були поранення і травми (переломи та розтягнення зв'язок) (17,4%). В проведенному дослідженні уточнено, що захворювання, які передаються статевим шляхом не мали епідеміологічного значення в дослідженій популяції. Повернення військовослужбовців в США по медичним показникам склало 9,3 % від загальної чисельності військ. 0,9 % американських солдат загинули в Іраку (бойові поранення).