



MEDAX 2001 – Summary of the Medical Corps Session

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During the 2001 MEDAX conference the Israel Defense Forces Medical Corps held a session in which some of its main research projects and medical activities were presented to the civilian medical community. We present a summary of the principle themes.

Exposure to toxins in polluted waters

Lieutenant Colonel Dr. S. Moshe elaborated on one of the most intriguing matters in military public relations: the exposure of elite commando warriors to toxic compounds while diving in the polluted waters of the Kishon River. It is assumed that diving operations in polluted waters during the last two decades increased the range of materials to which divers have been exposed. Most of the toxic compounds can be categorized into several subgroups: petrochemicals, chlorinated hydrocarbons, noxious gases, strong acid bases, and heavy metals. Since the “Kishon Affair” surfaced in the media’s headlines, the Israel Navy and the Medical Corps have carried out an extensive survey of the hazardous materials and chemical metabolites along the Mediterranean seashore, particularly in the polluted harbors of Haifa and Ashdod. The evaluation comprised monitoring the concentrations of 50 toxic compounds in the marine environment of more than 20 stations along the seashore, and biologic monitoring of 20 toxicologic metabolites tested in the divers’ blood samples.

The environmental results showed that almost all the materials’ concentrations were 100 times lower than the standard permitted in drinking water. The results of the tests performed in the sera samples were all found to be within normal limits. These results indicate that diving and swimming activities in polluted environments did not result in the accumulation of toxic compounds in the divers’ blood. Despite these findings, the public concern is easily understood. A committee of specialists has been appointed to define safety standards for diving in chemically polluted waters. To the best

of our knowledge this experience is unprecedented and no similar guidelines exist in foreign navies.

Seroprevalence to measles, mumps and rubella among IDF recruits

Major Dr. N. Davidovitch discussed the trends of seroprevalence to measles, mumps and rubella among IDF recruits during the last decade. In March 2000 an outbreak of rubella occurred in the IDF. In response to this epidemic, a widespread vaccination campaign with the measles, mumps and rubella vaccine was initiated. With the cessation of new cases, we faced the issue whether the vaccination policy of new recruits should be altered. Since the prevalence of measles, mumps and rubella antibodies among young Israeli male and female adults was studied in 1987, 13 years before the current outbreak and prior to the large immigration waves from the former Soviet Union, we decided to reevaluate the seroprevalence of rubella antibodies among young Israeli adults. Our study comprised 400 sera samples drawn from IDF recruits entering service in 1999, prior to the rubella outbreak. The MMR seroprevalence rates were determined according to the enzyme-linked immunosorbent immunoglobulin G antibody test at the central IDF laboratory.

The seroprevalence rate for MMR in young adults in 1999 was found to be below herd immunity. There was a significant decrease in the seroprevalence rate for rubella and mumps in young adults in 1999 as compared to young adults in 1987, and a significant increase for measles [Table 1]. A significant difference favoring a higher seroprevalence rate in young women was detected in 1999. Following the results of this

Table 1. Seroprevalence rate for measles, mumps and rubella in male and female army recruits, 1999 vs. 1987

	Males		Females	
	1999	1987	1999	1987
Measles	91%	72.4%	87.2%	74.4%
Mumps	82.3%	95.2%	78.4%	92.8%
Rubella	70.9%	88%	90.8%	98.1%

IDF = Israel Defense Forces
MMR = measles, mumps, rubella

study, MMR vaccination was introduced as part of the vaccination policy for new recruits in the IDF.

Lessons learned from combat injuries during the current riots in the occupied territories

Lieutenant Colonel G. Lin described the patterns of injuries, pre-hospital treatment and evacuation procedures during the recent year of ongoing riots in the occupied territories. The presented data were collected during the first 4 months of the hostile events and included all the IDF soldiers injured during that period.

The overall mortality rate for the 365 injured was 6%. Ninety-six soldiers were hospitalized. The injuries recorded in this subgroup were caused by gunshot wounds (64%), shrapnel (13%), and stone tossing (9%). The main anatomic body regions injured were head, face and neck (54%), limbs (50%) and trunk (25%). Injury severity distribution was bimodal with the largest group (68%) represented by patients with an Injury Severity Score between 1 and 14. Twenty-three (29%) soldiers had fatal wounds: 16 were killed in action and 7 died in hospital. The mean time elapsing from injury to arrival of the first physician was 18 minutes. Ambulances evacuated 84% of the injured subjects, and the rest were air-borne. All casualties but one reached hospital within 1.5 hour. Three-quarters of the injured were evacuated to trauma centers and 25% to other hospitals. The group of soldiers evacuated to trauma centers had a significantly ($P=0.021$) higher mean Injury Severity Score. Thirty-four of the injured soldiers treated by the IDF medical staff needed emergency airway management; of them 22 (65%) suffered from head injuries. In all cases, between 1 and 4 (mean 1.6) attempts at endotracheal intubation were made. The success rate of endotracheal intubation by physicians and paramedics did not differ significantly, with a total success rate of 62%. In the 13 patients in whom endotracheal intubation was unsuccessful, a laryngeal mask airway was placed in 2 and a coniotomy was performed in 8 (only one attempt was unsuccessful). All in all, patent airway was maintained in 29 patients (a success rate of 85%). Intercostal needles were inserted into eight patients with bilateral application in five of them. Drainage by chest tube was performed in 15 cases, 13 of them successfully.

In conclusion, the abundance of head, face, neck and limb injuries might be attributed to the fact that standard army armor offers only partial protection to these anatomic regions. The high rate of head injuries might be ascribed to the widespread use of accurate weapons. The distribution of injury severity suggests that only a small proportion of the injuries led to unpreventable death. The evacuation of the injured was remarkably prompt. Ground evacuation proved superior to airborne evacuation in most cases. This con-

flict was the first opportunity for the paramedics who recently joined the staff of the Medical Corps to practice. Their integration seems highly successful. Nowadays they are posted to locations reserved previously for physicians. The low intensity profile of this protracted conflict is characterized by close proximity to urban hospitals and high availability of military and civilian medical services. Future measures to increase cooperation between these two main first-aid givers are warranted.

Anthropometric parameters in women training in field units

Major Y. Heled reported on the initial anthropometric findings in female recruits during their basic training in IDF field units. Recently, women recruits were permitted to volunteer and serve aside male soldiers in combat units. Although many comparative physiologic studies between males and females have been conducted, this issue has never been investigated in Israeli recruits. The purpose of this preliminary study was to compare selected physiologic and anthropometric parameters relevant to the military setting in male and female recruits, before and after 8 weeks of basic training. The study group comprised 18 male and 14 female recruits (aged 18 ± 1 years). Anthropometric measurements included body weight and body fat percentage. Physiological variables included VO_{2max} , VO_2 while walking at 5 km/hour, 30 sec all-out cycle ergometer anaerobic test, 2 km run and 1 minute sit-ups. As shown in Table 2, except for sit-ups, male soldiers had a significant advantage in all physiologic variables compared with females ($P<0.05$), however there was no improvement in physical fitness in either group after basic training.

As for injuries, 6 females (42%) sustained stress fractures during the basic training period compared with only 2 males (11%) ($P<0.05$). The data show that males had a significant advantage over females in physiologic variables relevant to military needs. No physiologic improvements were found at the end of 8 weeks of basic training in either group. Moreover, body fat percentage rose in the females, and they sustained stress fractures more than four times compared to males. These data imply that physical fitness testing should be done before the admittance of females to combat units, and that a different physical training program should be adapted for them.

Table 2. Anthropometric and physiologic variables in male and female recruits before and after basic training

	Females		Males	
	Before	After	Before	After
Weight (kg)	57 \pm 7.70	60.25 \pm 2.36	65.9 \pm 8.30	67.13 \pm 1.81
Body fat (%)	22 \pm 1.36	24.72 \pm 0.89	15.37 \pm 1.06	15.47 \pm 0.93
VO_{2max} (ml/kg/min)	38.87 \pm 2.38	38.9 \pm 1.5	53.01 \pm 3.01	53.03 \pm 2.67
VO_2 / VO_{2max} (%)*	40 \pm 4.20	41 \pm 3.27	23.4 \pm 1.29	25.5 \pm 2.10
Anaerobic test (watt/kg)	4.74 \pm 0.42	4.6 \pm 0.51	8.62 \pm 0.47	8.6 \pm 0.42
2 km run (min)	11.59 \pm 0.34	Not available	8.82 \pm 0.27	Not available
1 min sit-ups	62 \pm 6	80 \pm 6	64 \pm 6	80 \pm 4

* Ratio of VO_2 at 5 km/h against VO_{2max} .

Israeli Medical Corps field hospitals: providing humanitarian aid

Lieutenant Colonel Dr. H. Amital presented the experience that the Medical Corps obtained following the deployment of four field hospitals overseas between 1999 and 2001. In 1999 the war in Kosovo resulted in hundreds of thousands of Albanian refugees lacking basic medical care, two large-scale earthquakes in Turkey in 2000, and a similar catastrophe in India at the beginning of 2001 overwhelmed the local authorities and medical community. Although these events differed in many aspects, the deployment of field hospitals to such remote areas shares many common medical and logistic steps.

Following an immense mass disaster it is of great importance to exactly map the disaster site either via international media or by diplomatic or military ties. Gathering basic data on the population's needs helps to define the precise aid that is mainly required. Any data concerning local general and medical facilities that remain functioning are vital for proper planning of the professional composition of the medical mission. Data on ongoing epidemics and existing sanitary conditions are important for disease-control programs. Logistic personnel should load the medical equipment and supplies such that unloading will be smooth and quick. Once the field hospital is erected in the optimal location, in proximity to local medical

services and to the patients, the drafting of local personnel willing to translate and to assist with maintenance issues is needed. The goodwill of local citizens and international organizations is welcomed as long as it does not lead to chaos. Maintenance of the field hospital requires medical supplies and appropriate logistic control.

Our previous experience has taught us that proper timing is of utmost importance in such missions. The flexibility of our medical units has enabled us to deploy them rapidly regardless of the destination and the surrounding conditions. Once a government decision has been reached, within 2 to 3 days the relevant field hospitals are ready to open their gates to the sick and injured. In our experience a 2 week interval is needed for other organizations to set up medical facilities planned to be stationed for longer periods.

In conclusion, the flexibility of the medical units in the Medical Corps bears a major advantage when deploying such a mission. The IDF Medical Corps' granting of hospitalization facilities and providing humanitarian aid, regardless of disaster location or severity, is greatly valued worldwide.

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