

highly skilled manpower (physicians, clinical microbiologists, pharmacists) and development of relevant computer applications. Third, the position paper could have been intended as a response to the initiatives by Ministry of Health National Center for Infection Control and Antibiotic Use. The latter was set up more than a decade ago to deal with emerging multi-drug resistant pathogens and to provide professional leadership. Unfortunately, a professional conflict has emerged between the ISID and the National Center, when the latter was trying to impose professional guidelines regarding antibiotic stewardship unilaterally. While Neshet and Strahilevitz outline the ISID view on antibiotic stewardship in Israeli hospitals, they also call for cooperation and joining forces to combat the huge problem of antibiotic resistance in Israel. Forth, the position paper was probably also intended for all physicians who prescribe antimicrobials, to engage them in the responsibility of guarding antibiotics for us and the next generations. ●

THE EFFECT OF PNEUMOCOCCAL CONJUGATE VACCINE ON PNEUMOCOCCAL CARRIAGE AND INVASIVE DISEASE

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Pneumococcal infections are an important cause of morbidity and mortality among children and adults worldwide. Acquisition and carriage of pneumococci are essential for the development of pneumococcal invasive (bacteremia, meningitis) and non-invasive disease. Pneumococcal conjugate vaccines (PCV) differ from the polysaccharide vaccine (PPV23) in its enhanced immunity and ability to prevent carriage of pneumococci. With the implementation of PCV to pediatric vaccination programs in different countries, we witnessed a change in the patterns of pneumococcal carriage and illness. In this review the authors present some of the changes that were observed with the implantation of PCV in Israel and other countries regarding pneumococcal carriage and invasive disease, with emphasis on the direct and indirect effect of this vaccine. ●

ANTIBIOTIC STEWARDSHIP IN ISRAEL - WHERE ARE WE HEADED IN 2018?

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We live in an age where antibiotic resistant pathogens are common, and we see an increase in infections caused by multidrug resistant pathogens. This arises from the broad

use of antibiotics, many times inappropriately, combined with slackening in recent years of new antibiotic development. This combination of events threatens the core of modern medical care, increasing the number of patients with resistant infections resulting in prolonged illness with high morbidity and mortality. Most antibiotics are not prescribed by infectious disease specialists and inappropriate antibiotic use habits foster increased resistance. When prescribing an antibiotic to a patient, the physician impacts the society and environment, as well as his patient, hence the critical need for implementing antibiotic stewardship programs.

The incorporation of electronic medical records into medical care in the last decade provides effective opportunities for implementing antibiotic stewardship. In this review we present the elements of antibiotic stewardship and suggest different methods for Israeli medical organizations to implement an antibiotic stewardship program. There are many different interventions that may be applied, and each institution or organization must evaluate their unique environment and challenges and implement a program that has the best possibility to succeed. There is no single program that fits all. The programs must be led by Infectious Disease specialists and management must prioritize the resources needed and continuously stay involved to keep the agenda in the forefront, so we may lead a change in our healthcare system, which is critical for our health and for the future of modern medicine. ●

TRAVEL MEDICINE IN ISRAEL: ITS HISTORY AND CONTRIBUTIONS TO THE DISCIPLINE

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The last century in Israel had seen a profound change in the field of travel-related infectious diseases.

During the 19th century and throughout the first half of the 20th century, most scientific observations related to the various endemic infections in Palestine, and the risk they posed to the passengers/immigrants. Among the infectious hazards that have characterized the country, malaria, typhoid, cutaneous leishmaniasis, and bilharzia were especially noteworthy.

With the establishment of the State of Israel and following the great waves of immigration to Israel, many endemic diseases declined or were completely eradicated, such as malaria. Since the 1980's, the emergence of the Israeli backpacking phenomenon was accompanied by a surge of imported infectious diseases, from Latin America, the Far East and Africa. Israeli travel medicine has documented these developments, with an important contribution to the literature on epidemiology, clinical aspects and the treatment and prevention of many travel-related infections. ●

[20.61 DDD/1000 person/day, and 17.02% in 2015]. Both overall volume and the proportion of second-line antibiotics rose with age and were higher among women especially in the 20-40 years age bracket (overall volume of 23.98 DDD/1000 person/day, proportion of second-line antibiotics of 23.98% VS 17.41 and 19.17% in men). Higher overall use was observed among patients of low SEP.

Conclusions and discussion: The observed volume of systemic antibiotics and the proportion of second-line antibiotics dispensed in the Israeli community were stable and high. Higher use was observed among older individuals, women and patients of low SEP. Our results call for the implementation of a national-level, community-based antibiotic stewardship program. QICH might serve to monitor such a program. ●

HANTAVIRUS PULMONARY SYNDROME DIAGNOSED IN A RETURNED TRAVELER FROM THE USA

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Hantavirus pulmonary syndrome (HPS) is a rare and sometimes fatal respiratory disease in humans. The infection is acquired mainly through inhalation of aerosolized rodent secretions which serves as the reservoir for the virus. HPS cases are mostly reported from the American continent.

In this article we describe a case of fulminant HPS in a 47 years old man who had traveled with his family on vacation to the southwestern region of the United States. The patient was hospitalized one month after his return to Israel and the diagnosis of hantavirus infection (species Sin Nombre Virus), was performed on samples sent to the CDC's Viral Special Pathogens Branch.

Clinicians should be aware of this special entity and consider HPS in the differential diagnosis of patients with respiratory failure and fever, when there is a history of travel to the endemic area. ●

ISRAELI VOLUNTEERS ON THE YWAM SHIP, PAPUA NEW GUINEA, 2018

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Background: Papua New Guinea (PNG) is a young nation. It has been independent since 1975. It consists of more than 290 inhabited islands, and its people speak more than 800 different languages. The GDP per capita is \$2100, and only 4.3% is spent on health care. Government services are scarce in remote islands. It is a tropical country, with many tropical diseases.

YWAM Medical Ships - Australia is a Christian charity that is actively developing communities by addressing health care and training needs in PNG in partnership with the relevant national and provincial government administrations. The program is guided by the PNG's National Health Plan: 2011- 2020.

Methods: As part of this effort YWAM runs the YWAM PNG, a large hospital ship that serves the remote parts of the country. The services provided include mentoring and support of local health care teams, eye surgery, dentistry, and three mobile teams that include primary health care, mother and child care, childhood immunizations, physiotherapy, optometry and health education. The Israeli Ministry for Foreign Affairs signed a joint declaration of intent (DOI) with YWAM last year. The DOI outlines the Ministry for Foreign Affairs commitment to encourage Israeli medical professionals to volunteer onboard the MV YWAM PNG, in rural and remote areas of PNG.

Results: This paper summarizes the experience of four infectious diseases specialists on board. The main infections observed were malaria, tuberculosis, tropical ulcers and filariasis.

Recommendations: The exposure to primary care in a remote part of the world is an emotional, personal and professional experience which can benefit the population the ship serves, as well as the volunteers, for whom the outreach on the ship is a memorable experience. ●

PRINCIPLES OF APPROPRIATE ANTIBIOTIC USAGE IN ISRAEL BY THE ISRAELI SOCIETY FOR INFECTIOUS DISEASES: TO WHOM ARE THEY DIRECTED?

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In this issue of Harefuah Neshet and Strahilevitz discuss the principles of appropriate antibiotic guidelines based on a position paper by the Israeli Society for Infectious Diseases (ISID). This editorial discusses for whom this position paper was intended. The first and most obvious target would be the Infectious Disease (ID) physicians themselves. Since the setup of ID units in Israeli hospitals in the 1970s and 1980s, all have engaged in antibiotic control and infection control. Antibiotic control in Israel has always consisted of antibiotic restriction, development of guidelines for the most commonly encountered infections, and oversight of adherence to guidelines (including computer applications). In comparison, antibiotic control was not an ID priority in US hospitals until the concept of antibiotic stewardship emerged in the last decade. Second, the position paper could have been intended for hospital managements, in order to provide the resources necessary to make appropriate antibiotic use an attainable goal, in particular: allocation of

Objectives: We assessed MRSA prevalence, risk factors and clinical manifestations in children with *Staphylococcus aureus* infections in southern Israel.

Methods: Our medical center is the sole hospital in southern Israel. All medical files of *Staphylococcus aureus* infections during the period 2005-2015, were reviewed retrospectively.

Results: Overall, 1,062 SA infections (MRSA; n=164, 15%) were identified; 687 (65%) skin and soft tissue infections (SSTI), and 375 (35%) invasive infections.

MRSA was significantly more common in children <5 years (18% vs. 13% in children ≥5 years), Bedouin ethnicity (19% vs. 8% in Jewish children), burns (24% vs. 15%), congenital insensitivity to pain with anhidrosis (CIPA; 90% vs. 15%) and SSTI (17% vs. 12% in invasive infections). Blood count parameters and hospital-associated vs. community-acquired infection rates were similar comparing MRSA and Methicillin-susceptible *Staphylococcus aureus* (MSSA).

In multivariate analysis, age (odds ratio, OR=0.953), Bedouin ethnicity (OR=2.698), burns (OR=2.036) and SSTI (OR=1.674) were associated with MRSA. MRSA isolates were more frequently resistant than MSSA to clindamycin (30% vs. 14%), erythromycin (34% vs. 15%), co-trimoxazole, tetracycline, rifampicin, ciprofloxacin and gentamicin (4% vs. 0.5%, all). All isolates were vancomycin susceptible.

Conclusions: MRSA infections are common in young, Bedouin children and burns, and are more commonly multidrug resistant than MSSA in our region. Our data should be used to better identify and treat children with MRSA infection. ●

ANTIBIOTIC PRESCRIPTION ERRORS IN PATIENTS HOSPITALIZED IN INTERNAL MEDICINE DEPARTMENTS – A PROSPECTIVE COHORT STUDY

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Background: Prescription errors are common and associated with significant adverse drug events (ADEs), morbidity and mortality, and health care expenditures.

Aims: To examine the prevalence of antibiotic prescription errors in three medical departments.

Methods: A prospective observational cohort study was conducted in three medical departments, including consecutive patients with suspected or proven infections, and/or antibiotic prescriptions. The primary outcome was the proportion of prescription errors, defined as: contraindications, inadequate dose regimen, and unnecessary antibiotic treatment. Secondary outcomes included incidence of ADEs, proportion of potential drug-drug interactions (DDIs) with clinical relevance, and prevalence of inadequate monitoring for ADEs and therapeutic drug monitoring (TDM).

Results: We identified 327 patient-episodes in 295 patients. The most common infectious diagnoses were urinary tract infection and pneumonia. Among 633 prescriptions, 113 (18%) contained errors in 87 (27%) patient-episodes. The most common types of error were inappropriate dose adjustment for renal function and unnecessary treatment. There were 6 prescriptions with contraindications (0.9%). Laboratory monitoring was required in 259 patient-episodes but inadequate in 40 (15%). TDM was required in 40 patient-episodes, but was not performed in 25 (63%). There were 69 ADEs in 61 patient-episodes (19%). Compared to patients without ADEs, patients who developed ADEs had more prescription errors (p=0.055), more potential DDIs (p=0.012), and received more often antibiotics that needed monitoring and TDM.

Conclusion: Antibiotic prescription errors in medical departments are common and may be associated with significant ADEs. Our findings may help in prioritizing the customization of prescription computer decision support systems to improve antibiotic prescription. ●

ANTIBIOTIC USE IN COMMUNITY HEALTHCARE IN ISRAEL AS REFLECTED IN THE NATIONAL PROGRAM FOR QUALITY INDICATORS

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Background: Antibiotic overuse is prevalent and has grave implications, primarily the emergence of resistant pathogens - an urgent public health concern worldwide.

Aims: We sought to evaluate the extent of overall and second-line systemic antibiotic use in the Israeli community, to compare them to international data and to monitor temporal trends.

Methods: The Israel National Program for Quality Indicators in Community Healthcare (QICH) obtains data from electronic medical records from the 4 health-plans, covering the entire civilian population. We assessed 2 quality indicators, compatible with those of the OECD:

1. Overall volume of antibiotics for systemic use dispensed.
2. Volume of second-line antibiotics as a proportion of all systemic antibiotics.

Analysis was stratified by gender, age and socio-economic position (SEP).

Results: The volume of systemic antibiotics dispensed in 2016 was 20.76 DDD/1000 person/day, with second-line antibiotics comprising 22.0% of the total. These values have been stable since 2014, and are higher compared with the OECD averages

DIABETES AND RAMADAN FASTING – UPDATE 2019

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Fasting during the month of Ramadan and other religious fasting days presents a challenging issue for healthcare practitioners (HCP). Education and instructions for patients with diabetes who intend to fast is mandatory during the pre-Ramadan period. This period represents a golden opportunity to evaluate the general health status of the patients including their risk associated with fasting. Furthermore, it allows HCP to revise and adapt suitable changes for their anti-diabetic therapy before initiating fasting. Therapy with high safety profile agents such as incretin-based therapy is more favorable than therapy with moderate-low safety profile agents such as sulphonylureas (SUs) and insulin to be administered during the month of Ramadan. Patients already receiving treatment with sodium glucose co-transporter 2 inhibitors (SGLT2i) need thorough medical evaluation during the pre-Ramadan period in order to enable them to fast safely during the month of Ramadan using this class of agents. The aim of this review is to provide HCP in Israel with instructions and recommendations for better management of diabetic patients during Ramadan, while taking into consideration the recently published data and therapies available in Israel. ●

WHO'S AFRAID OF INFECTIOUS DISEASES – A DISCIPLINE WITH BROAD IMPACT

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The Infectious Diseases discipline is diverse, dynamic, vibrant, ever-changing, exciting and fascinating. The Infectious Diseases specialists have a major contribution both to the successful outcome of the individual patient with an infectious episode and to public health on multiple levels. The involvement of infectious diseases specialist in complex infections has shown to reduce mortality by about 50%. On the background of the global antimicrobial resistance crisis, the infectious diseases specialists have assumed another important role: to guard antibiotics and fight resistance.

As a response to the crisis, guidelines to balance between the need for high quality treatment for the individual patient and sensible use of antibiotics were issued. These were

named antibiotic stewardship programs. The Israeli Society of Infectious Diseases, instituted in 1979, has risen to the challenge and undertaken leadership in promoting antibiotic stewardship programs in Israel.

This edition of Harefuah, dedicated to the disciple of Infectious Diseases, includes several original articles and reviews representing a selection of the major activities of the Israeli Infectious Diseases specialists. The topic of antibiotic stewardship is emphasized in this edition; it is covered by two original articles, a review and an editorial. Other topics covered are antibiotic resistance, vaccine effects, travel medicine and international medicine.

The field of infectious diseases is facing important challenges, among them responses to the global antibiotic crisis and the development of efficient vaccines to fight life-threatening endemic and emerging infections, as well as future epidemics. The Israeli Infectious Diseases specialists are also committed to these important tasks. ●

A RARE CASE OF ADULT MENINGOCOCCAL SUPRA-GLOTTITIS AND BACTERAEMIA DUE TO NEISSERIA MENINGITIDIS TYPE Y

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Acute epiglottitis/ supraglottitis is an acute disease with potential life-threatening complications such as airway obstruction. We present the case of an 85 year old woman hospitalized due to pain in her neck,odynophagia and unclear speech. Bacteraemia with Neisseria meningitidis type Y was detected. The patient was treated with Ceftriaxone and corticosteroids with resolution of symptoms. In a literature review we found only 21 additional cases of epiglottitis and bacteraemia due to Neisseria meningitidis, 52% of which were caused by serogroup Y. All the patients with supraglottitis caused by Neisseria meningitidis were bacteremic, and 69% of them suffered from airway compromise. Routine drawing of blood culture in supraglottitis patients can lead to higher detection rates of Neisseria meningitidis cases. ●

METHICILLIN-RESISTANT VS. METHICILLIN-SUSCEPTIBLE STAPHYLOCOCCUS AUREUS (MRSA VS. MSSA) INFECTIONS IN CHILDREN IN SOUTHERN ISRAEL

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Background: Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major cause of morbidity. Data regarding MRSA infections in children in Israel are scarce.