vaccination of adults and the elderly person against pneumococcal disease. Vaccinations of preschool and school children are most commonly associated with vaccinations from the national vaccination programs and with existing experts recommendations. In Croatia we are achieving satisfactory vaccination coverage for preschool and school children vaccinations from compulsory vaccination schedule. Tetanus vaccination is part of a compulsory vaccination program and the vaccination report for 2017 showed a vaccine coverage of less than 50%. Last year, less than 10% of the population was vaccinated against flu, including about 30% of the elderly, significantly less than the World Health Organization's recommendations. According to the available published data on the vaccination of chronic flu patients, it is not possible to determine what chronic conditions were involved.
Data for countries with an influenza vaccination coverage of more than 20%, such as the Netherlands and the United Kingdom, showed a reduction in hospitalizations of more than 20%, while in Canada, for example, influenza vaccination may be reduced by almost 50%. A study conducted in the largest European countries found that the cost of a lifetime vaccination for an individual ranges from € 443 for a healthy male in Sweden (10 antigens) to € 3 395 for a female patient with chronic illness in the United Kingdom (15 antigens), which is still more economically viable than treating the disease and the possible consequences of the disease.
Conclusions: Despite existing evidence of lifelong vaccination benefits and recommendations for vaccination of adults and the elderly against influenza and pneumococcus, lifelong vaccination practices in Croatia do not yet show results visible at the population level that could have a measurable effect on savings in the health care system. To see the true potential of lifelong vaccination as a strategy not only for the prevention of disease and comorbidity, but also for the purpose of reducing health care costs, this theme should go beyond profession, and at the population level, individuals and communities should recognize the value of vaccines and seek for vaccination as a their right and responsibility.

Key words: vaccination, adults, health care system

SMANJENJE UČINKOVITOSTI CJEPIVA ZA DJECU ZBOG POVIŠENE TEMPERATURE OKOLIŠA

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Sažetak
Uvod: U vrijeme ljetnih mjeseci mnogi su lijekovi izloženi neadekvatnim temperaturama pri skladištenju, što može dovesti do njihove smanjene učinkovitosti. Cjepiva se svrstavaju u kategoriju lijekova koji su najosjetljiviji pri čuvanju na visokim temperaturama okoliša.
Metode: Uspoređena su cjepiva koja se nalaze na listi obaveznog cijepljenja djece Hrvatskog zavoda za javno zdravstvo s njihovom opisanom stabilnosti na različitim temperaturama prema informacijama o stabilnosti cjepiva Svjetske zdravstvene organizacije.
Rezultati: Većina cjepiva najstabilnija je i najbolje se čuva pri temperaturi 2-8□C. Pri izlaganju visokim temperaturama najosjetljivije je inaktivirano cjepivo za poliovirus, koje je već pri temperaturi većoj od 20□C stabilno samo nekoliko tjedana. Pri skladištenju na temperaturi od 37□C, cjepivo za ospice, zaušnjake i rubelu stabilno je dva tjedna, dok cjepivo za *Pertussis* virus zadržava svoj učinak samo tjedan dana. Cjepivo protiv hepatitis B virusa pri istoj temperaturi nakon mjesec dana skladištenja gubi do 20% svoje učinkovitosti, a pri temperaturi od 45□C može se održati samo nekoliko dana, dok su ostala navedena cjepiva pri toj temperaturi u potpunosti nestabilna ili neadekvatno učinkovita. Kao najstabilniji u skupini obaveznih cjepiva za djecu pokazali su se toksoidi difterije i tetanusa koji se mogu održati na temperaturama do čak 55□C.

Zaključak: Vrlo je važno educirati i informirati liječnike o pravilnom skladištenju cjepiva, posebice u ljetnim mjesecima i za vrijeme velikih vrućina. U slučaju nepravilnog skladištenja, velika je opasnost od smanjene učinkovitosti cjepiva, što može dovesti do neadekvatne zaštite cijepljene djece.

Ključne riječi: Cjepivo, stabilnost, visoka temperatura, učinkovitost, djeca

DECREASE IN EFFICACY OF CHILD VACCINES DUE TO HIGHER ENVIRONMENT TEMPERATURES

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Abstract

Introduction: During summer months, many medicines are exposed to inadequate storage temperatures, which can decrease their efficacy. Vaccines are listed among the group of medicines that are most sensitive to storage in high temperatures.

Methods: A list of mandatory childhood vaccines was obtained from the Croatian Institute for Public Health. Those vaccines have been compared with regard to their described stability at different environmental temperatures, according to information from the World Health Organization.

Results: Majority of vaccines are most stable and best stored at temperatures between 2 and 8 °C. At high temperature exposure, the most sensitive vaccine is the inactivated vaccine for poliovirus, which can remain stable for only a few weeks if stored at temperatures of 20°C or higher. When stored at 37°C, the MMR vaccine is stable for two weeks, while the Pertussis vaccine retains its effect for only a week. At that temperature Hepatitis B vaccine loses 20% of its effectiveness. At 45°C it lasts no more than a few days, while other listed vaccines are either completely unstable, or inadequately effective at temperatures that high. Out of the listed vaccines, the most stable is the tetanus and diphtheria toxoids one which can be stored at temperatures of up to 55°C.

Conclusion: It is of utmost importance to educate and inform physicians about proper ways of storing vaccines, especially during the summer months. In case of inappropriate storage, there is a risk of diminished effect of vaccines, which can lead to inadequate immunization of children.

Key words: Vaccine, stability, high fever, efficacy, children

KONDUKTIVNI POREMEĆAJ MEĐU DJECOM S PREKOMJERNOM TJELESNOM MASOM I DEBLJINOM: SUSTAVNI PREGLED LITERATURE I META-ANALIZA

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Sažetak

2016. je godine procijenjeno kako je broj djece i adolescenata s prekomjernom tjelesnom masom (ptm) i debljinom (deb) u zadnjih 40 godina porastao čak 10 puta. Mladi koji pate od prekomjerne tjelesne mase i debljine češće obolijevaju od psihičkih poteškoća. Neke studije su pokazale povezanost između konduktivnog poremećaja i debljine, no druge studije ne pokazuju takav rezultat. Cilj je ovog sustavnog pregleda i meta-analize bio proučiti povezanost konduktivnog poremećaja s ptm i deb među djecom i adolescentima. Sustavno je pretraživanje literature provedeno 31. listopada 2019. u bazama: MEDLINE preko OVID-a, PsycINFO i PsycARTICLES preko EBSCOhost, SCOPUS i OpenGrey. Uključene su