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HIV/AIDS

HIV (human immunodeficiency virus)/AIDS (acquired immune deficiency syndrome) remains one of the world's most significant public health challenges, particularly in low- and middle-income countries. As a result of recent advances in access to antiretroviral therapy (ART), HIV-positive people now live longer and healthier lives. In addition, it has been confirmed that ART prevents onward transmission of HIV.

WHO has released a set of normative guidelines and provides support to countries in formulating and implementing policies and programmes to improve and scale up HIV prevention, treatment, care and support services for all people in need.

HIV infects cells of the immune system

HIV is coated in an “envelope protein” that is particularly “flexible,” making it able to wriggle away from antibodies that would effectively try to attack the virus. The HIV virus also rapidly develops reservoirs once it infects a cell. They permanently become a part of that cell forever, establishing these permanent reservoirs. Essentially, HIV is a tough virus to crack.
Infection results in the progressive deterioration of the immune system, breaking down the body's ability to fend off some infections and other diseases. AIDS refers to the most advanced stages of HIV infection, defined by the occurrence of any of more than 20 opportunistic infections or related cancers.

HIV can be transmitted in several ways

- the transmission between a mother and her baby during pregnancy, childbirth and breastfeeding.
- unprotected sexual intercourse with an infected person
- transfusions of contaminated blood or blood products or transplantation of contaminated tissue
- the sharing of contaminated injecting equipment and solutions or tattooing equipment
- through the use of contaminated surgical equipment and other sharp instruments

36.9 million people are living with HIV worldwide

Globally, an estimated 36.9 million people were living with HIV in 2017, and 1.8 million of these were children. The vast majority of people living with HIV are in low- and middle-income countries. An estimated 1.8 million people were newly infected with HIV in 2017. An estimated 35 million people have died from HIV-related causes so far, including 940 000 in 2017.

There are several ways to prevent HIV transmission

- get tested and treated for sexually transmitted infections, including HIV to prevent onward transmission
- when injecting drugs, always use sterile needles and syringes
- ensure that any blood or blood products that you might need are tested for HIV
- access voluntary medical male circumcision (VMMC) if you live in one of the 14 African countries where this intervention is promoted. Though VMMC may be conducted for a number of reasons, evidence from three clinical trials has shown that medical male circumcision can significantly reduce (but not eliminate) men’s risk of acquiring HIV through sexual intercourse.
- if you have HIV start antiretroviral therapy as soon as possible for your own health and to prevent HIV transmission to your sexual or drug using partner or to your infant (if you are pregnant or breastfeeding);

- use pre-exposure prophylaxis prior to engaging in high risk behaviour; demand post-exposure prophylaxis if there is the risk that you have been exposed to HIV infection in both occupational and non-occupational settings.

Combination antiretroviral therapy (ART) prevents HIV from multiplying in the body

If the reproduction of HIV stops, then the body's immune cells are able to live longer and provide the body with protection from infections. Effective ART results in a reduction in viral load, the amount of virus in the body, greatly reducing the risk of transmitting the virus sexual partners. If the HIV positive partner in a couple is on effective ART, the likelihood of sexual transmission to the HIV-negative partner can be reduced by as much as 96%. Expanding coverage of HIV treatment contributes to HIV prevention efforts.

As of end-2017, 21.7 million people were receiving ART worldwide

Of these, almost 20 million lived in low- and middle-income countries. However, globally, only 59% of people living with HIV in 2017 were receiving ART. In 2016, WHO released the second edition of the "Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection." These guidelines present several new recommendations, including the recommendation to provide lifelong ART to all children, adolescents and adults, including all pregnant and breastfeeding women living with HIV, regardless of CD4 cell count as soon as possible after diagnosis. WHO has also expanded earlier recommendations to offer pre-exposure prophylaxis of HIV (PrEP) to selected people at substantial risk of acquiring HIV. Alternative first-line treatment regimens are also recommended.

HIV testing can help to ensure treatment for people in need

Access to HIV testing and medicines should be dramatically accelerated in order to reach the goal of ending AIDS by 2030. HIV testing reach is still limited, as an estimated 25% of people with HIV or 9.4 million people remain undiagnosed and don't know their infection status. WHO is recommending innovative HIV-self-testing and partner notification approaches to increase HIV testing services among undiagnosed people.

An estimated 1.8 million children are living with HIV

According to 2017 figures most of these children live in sub-Saharan Africa and were infected through transmission from their HIV-positive mothers during pregnancy, childbirth or breastfeeding. Close to 110 000 children (63 000–160 000) became newly infected with HIV in 2017 globally.

Elimination of mother-to-child-transmission is becoming a reality

Access to preventive interventions remains limited in many low- and middle-income countries. But progress has been made in some areas such as prevention of mother-to-child transmission of HIV and keeping mothers alive. In 2017, 8 out of 10 pregnant women (1.1 million) living with HIV received antiretrovirals worldwide. In 2015, Cuba was the first country declared by WHO as having eliminated mother-to-child transmission of HIV and syphilis. By end 2017, 10 countries were validated for eliminating mother-to-child HIV.

HIV is the greatest risk factor for developing active TB disease

In 2016, an estimated 1million of the 10.4 million people who developed TB worldwide were HIV-positive. In the same year approximately 370 000 deaths from tuberculosis occurred

among people living with HIV. The WHO African Region accounted for 86% of the estimated number of HIV-related TB deaths.

Are there any FDA-approved preventive HIV vaccines?

Efforts to create an effective HIV vaccine have proven a big challenge over the years. The results of the first vaccine trial to show any positive protection against HIV were published in 2009 in the New England Journal of Medicine. Currently, no preventive HIV vaccines have been approved by the Food and Drug Administration (FDA), but research is under way. A person must be enrolled in a clinical trial to receive a preventive HIV vaccine. The preventive HIV vaccines being studied in clinical trials do not contain HIV. Of the approximately 30,000 people who have participated in HIV vaccine studies around the world in the last 25 years, no one has gotten HIV from any of the vaccines tested.

Exposure in health care workers

The average risk of acquiring HIV infection after all types of percutaneous exposure to HIV-infected blood is 0.3%. Approximately 1 in 300–330 exposures will result in established HIV infection in health care workers. In 2007, globally there were 98 confirmed and 194 possible cases of health care personnel being infected occupationally. The risk of HIV infection increases following the exposure if the source patient has advanced HIV disease, the device was previously placed in source patient's blood vessel, there is visible blood on source device causing injury, amount of blood transferred, or if the injury is deep in nature. Injuries with solid needle, such as suturing needle, carry lower risk than hollow bored needle.

The source person is tested for HIV with pre- and post-test counseling. Two positive ELISA are considered to be highly suggestive of HIV. If the source patient cannot be tested or refuses to be tested, risk is assessed epidemiologically by the prevalence of HIV in the population, type of exposure, and risk assessment of the source person and his spouse. If the source person is HIV negative and has no clinical evidence of HIV infection, no testing of the source is required as the chances of source being in the window period of HIV infection, with no symptoms of acute retroviral syndrome is very less. All patients seeking care after HIV exposure should be tested for HIV at baseline and at 4–6 weeks, 3 and 6 months after exposure with pre- and post-test counseling.

The trauma site is washed immediately with soap and running water or mild disinfectant solution, such as chlorhexidine gluconate, that would not irritate the skin. Squeezing, rubbing, or using strong solution, such as iodine or bleach is discouraged.

Postexposure prophylaxis is started ideally within 2h and not later than 72h after exposure. It should not be delayed while waiting for test results and should be administered for 4 weeks if tolerated.

WHO recommended eligibility criteria for postexposure prophylaxis in occupational settings states that less than 72h should have been elapsed, the exposed person should not be a known HIV infected, the source person should be living with HIV or his status should be unknown, exposure should have been with blood, visibly blood stained fluids, concentrated viruses, cerebrospinal/peritoneal/ pericardial/pleural/synovial, or amniotic fluid, exposure penetrated the skin with spontaneous bleeding, deep puncture, splash or prolonged contact of an at-risk substance with nonintact skin, or in case of penetrated skin, the exposure should

have been from a recently used hollow bore needle or sharp object, visibly contaminated with blood.

ART can be started as basic or expanded regimen. Basic regimen consists of zidovudine 300 mg twice a day plus lamivudine 150 mg twice a day or stavudine 30–40 mg twice a day plus lamivudine 150 mg twice a day. Expanded regime consists of basic regime plus indinavir 800 mg 3 times a day/nelfinavir 750 mg, 3 times a day/ efavirenz 600 mg once a day. Both the regimen are for 28 days.

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OTC Medicines Corner

Nearly one-third of children use dietary supplements

An analysis of data from the National Health and Nutrition Examination Surveys (NHANES) from 2003 to 2014 published in *JAMA Pediatrics* found that approximately 33% of children and young adults (aged 0–19 y) use dietary supplements that range from multivitamins to melatonin to omega-3 fatty acids. Many of the most commonly used supplements, including multivitamins, are implicated in preventable adverse drug events among this population. In addition, commonly used nutritional products (eg, iron, calcium, and vitamin D) and alternative medicines (eg, bodybuilding supplements), are also increasingly associated with adverse cardiovascular effects, including arrhythmias, that can lead to sudden cardiac death, a serious yet underreported problem in children and adolescents. The growing use of alternative medicines, specifically melatonin and ω-3 fatty acid supplements, which are promoted as having cognitive and sleep benefits for patients with attention-deficit/ hyperactivity disorder, is particularly noteworthy given that attention-deficit/hyperactivity disorder drugs, which are frequently used in older children and adolescents, are also associated with serious cardiovascular effects.

Source: Qato DM, et al. Prevalence of Dietary Supplement Use in US Children and Adolescents, 2003-2014. *JAMA Pediatrics*. 2018;[Epub ahead of print].

Test Your Knowledge

1) Urticaria that appears rapidly after the ingestion of food usually indicates which type of hypersensitivity reaction?
   (A) Type I (B) Type II (C) Type III (D) Type IV

2) Aseptic technique should be used in the preparation of all of the following medicat ions with the exception of:
   (A) Neomycin irrigation solution
   (B) Ganciclovir intraocular injection
   (C) Phytonadione subcutaneous injection
   (D) Ampicillin IV admixture piggyback
   (E) Bacitracin ointment

3) Which of the following complementary alternative medicines has been banned because of its association with eosinophilia-myalgia syndrome?
(A) melatonin (B) kava (C) L- tryptophan (D) valerian root

Real Enquiries

At the "Drug Information Center", we respond to enquiries from the professional healthteam as well as from others. Here's one of the enquiries received at the center:

Enquiry received from: Z.K.-*Pharmacist, Assiut*
Enquiry: How is it possible for a blood test results to show an Rh Negative blood type on the first pregnancy then change into Rh Positive when repeating the test on the second pregnancy? Is it harmful if the mother received the Rh immune-globulin if she's Rh positive?

Summary of the answer: It is not possible to change blood types. In routine blood testing, the Rh blood group type is divided into Rh(D+) called Rh-positive and Rh(D-) called Rh-negative on the basis of the apparent presence or absence of Rh(D) antigen on the red cells. There is, however, a small group of individuals with apparently Rh(D-) red cells on routine testing, but that do react when the D-typing test is performed using selected anti-R (D) reagents by the indirect antiglobulin test. Such cells are designated Du. "Du" variant is a very weak variant. The frequency of the Du phenotype is about 0.2% overall and about 1.5% of all Rh(D-) women. Thus, Du variant is an Rh positive antigen which is weakly expressed on the red cells and such individuals are labelled Rh-positive.

Nowadays, every apparently Rh-negative woman should be further tested for the Du variant. If it's positive, then the blood type is corrected to Rh Positive, and no Rh Immune-globulin is needed to be given. If this is the case, then the shot was received for nothing with the first pregnancy. Fear not, getting Rh immune-globulin when you're Rh Positive does no harm (except cost-wise!). But this test might not be available in testing labs. Of course, it is possible that blood tubes at the lab got mixed up with someone else's.

References: 1) Dileo GM. Is It Possible for an Rh Negative Blood Type to Switch to Rh Positive? [Internet]; 2011 [cited July 02, 2018]. Available at: https://www.babble.com/pregnancy/rh-in-blood/
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Measles cases hit record high in the European Region

Over 41 000 children and adults in the WHO European Region have been infected with measles in the first 6 months of 2018. The total number for this period far exceeds the 12-month totals reported for every other year this decade. So far, the highest annual total for measles cases between 2010 and 2017 was 23 927 for 2017, and the lowest was 5273 for 2016. Monthly country reports also indicate that at least 37 people have died due to measles so far this year.

Following the decade's lowest number of cases in 2016, there's a dramatic increase in infections and extended outbreaks. Countries were called on to immediately implement broad, context-appropriate measures to stop further spread of this disease. Good health for all starts with immunization, and as long as this disease is not eliminated countries are failing to live up to their Sustainable Development Goal commitments.

Seven countries in the Region have seen over 1000 infections in children and adults this year (France, Georgia, Greece, Italy, the Russian Federation, Serbia and Ukraine). Ukraine has been the hardest hit, with over 23 000 people affected; this accounts for over half of the regional total. Measles-related deaths have been reported in all of these countries, with Serbia reporting the highest number of 14.

In 2015, large outbreaks were reported in Egypt, Ethiopia, Germany, Kyrgyzstan and Mongolia. The outbreaks in Germany and Mongolia affected older persons, highlighting the need to vaccinate adolescents and young adults who have no protection against measles.
Measles also tends to flare up in countries in conflict or humanitarian emergencies due to the challenges of vaccinating every child. In 2015, outbreaks were reported in Nigeria, Somalia and South Sudan.

Uneven progress towards measles and rubella elimination

According to the latest assessment by the European Regional Verification Commission for Measles and Rubella Elimination (RVC), 43 of the Region's 53 Member States have interrupted the endemic spread of measles and 42 have interrupted rubella (based on 2017 reporting).

At the same time, the RVC expressed concerns about inadequate disease surveillance and low immunization coverage in some countries. It also concluded that chains of measles transmission continued for more than 12 months in some countries that had interrupted the endemic spread of the disease, reverting their status back to endemic.

Measles can be stopped

The measles virus is exceptionally contagious and spreads easily among susceptible individuals. To prevent outbreaks, at least 95% immunization coverage with 2 doses of measles-containing vaccine is needed every year in every community, as well as efforts to reach children, adolescents and adults who missed routine vaccination in the past. While immunization coverage with 2 doses of measles-containing vaccine increased from 88% of eligible children in the Region in 2016 to 90% in 2017, large disparities at the local level persist: some communities report over 95% coverage, and others below 70%.

WHO is working closely with Member States currently facing outbreaks to implement response measures, including enhanced routine and supplemental immunization as well as heightened surveillance to quickly detect cases. WHO is also working with other countries to attain the 95% threshold. "At this midterm juncture for the European Vaccine Action Plan, we must celebrate our achievements while not losing sight of those who are still vulnerable and whose protection requires our urgent and ongoing attention," says Dr Zsuzsanna Jakab, WHO Regional Director for Europe.."We can stop this deadly disease. But we will not succeed unless everyone plays their part: to immunize their children, themselves, their patients, their populations – and also to remind others that vaccination saves lives."

Egypt's Expanded Programme on Immunization (EPI)

EPI is a priority programme for Egypt due to its cost effective ability to save lives. EPI in Egypt has achieved several successes in controlling vaccine preventable diseases, including strong national vaccination coverage of over 90%, through an increase of vaccine coverage and continuous surveillance leading to reduced illness, disability and death from diseases such as diphtheria, tetanus, whooping cough, measles and polio.

The Ministry of Health and Population (MoHP) continues to advance its EPI efforts through the introduction of haemophilus influenza (Hib) vaccine as a component of PENTA vaccine, aiming at reducing morbidity and mortality due to bacterial pneumonia. In addition to this, the MoHP is introducing a pilot programme for birth dose of hepatitis B vaccine as a part of its plan of action to address viral hepatitis.

With high coverage rates for routine immunization, vaccine-preventable diseases have shown a remarkable decline in past decades. However, several factors indicate that there are still challenges, with measles outbreaks occurring in 2013 and 2014, and an increasing need for funding for new vaccine introduction.

In line with the Global Vaccine Action Plan 2010–2020, WHO continues to support Egypt's efforts in EPI through the training of vaccinators and supervisors in surveillance and routine immunization.

WHO provides direct support MoHP in the procurement of cold chain equipment, including fridge freezer and log tags. WHO also provides technical support with the introduction of IPV and financial assistance in maintaining acute flaccid paralysis surveillance.

Sources: 1) WHO. *Measles cases hit record high in the European Region.*[Internet] WHO Media Center; Aug 2018 [cited Aug 25 2018]. Available from: http://www.euro.who.int/en/media-centre/sections/press-releases/2018/measles-cases-hit-record-high-in-the-european-region
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Answers:

1. (A) Food allergies are usually type I reactions. In a patient with preexisting hypersecreted IgE specific to a food allergen and bound to mast cells, the allergic response usually occurs shortly after ingestion. Mast cell secretions lead to vomiting. Systemic spillover of allergen into the circulation may lead to milder effects in other tissues (e.g., urticaria).
2. (E) Irrigation solutions, ophthalmic preparations and parenteral products, and subcutaneous and IV medications should be prepared using aseptic technique. Since Bacitracin ointment is applied to the skin and does not bypass the body's protective barriers, its preparation would not be held to the same requirements.
3. (C) L-Tryptophan was banned in 1989 because of its association with eosinophiliamyalgia syndrome (EMS). However, it remains available for sale as a 500-mg capsule and the ban was lifted in 2005. A couple of cases of EMS were reported after reintroducing it. The risk of developing EMS increases with larger doses of tryptophan and increasing age.