What is new about the chickenpox vaccine?

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The commonest infectious disease of childhood worldwide is varicella. Previously, the disease is only modestly preventable by cumbersome infection control measures and expensive post-exposure prophylaxis with varicella-zoster immunoglobulin (VZIG). With advances in vaccinology, the disease has become vaccine-preventable.

The varicella vaccine (Oka strain), first engineered by Michiaki Takahashi, is the live-attenuated vaccine that has undergone the longest duration of pre-clinical and clinical studies before licensure. The vaccine, first registered in Hong Kong in 1995, is now available in 3 preparations locally. Despite the original US recommendation of universal immunisation for healthy children aged 12 months and older, and the absence of serious adverse events reported through post-marketing surveillance, vaccine coverage in both Hong Kong and the US has been far from satisfactory. Recently, the recommendations for use of this vaccine in the US has been revised to include certain immunocompromised individuals and for outbreak control. Potential indications for expanded use also exist and will be confirmed by further studies.

The cost-effectiveness, cost savings and cost-benefit ratio of this safe, well tolerated, immunogenic and efficacious vaccine, viewed on a population basis, has not been subjected to rigorous study locally and remains a public health controversy. Nevertheless, for personal protection of at risk individuals, and in light of the unpredictability of complications and increasing incidence of varicella-associated invasive group A beta-hemolytic streptococcal (GABHS) diseases in immunocompetent individuals, the protective value of the vaccine is beyond doubt.

The post-licensure effectiveness or "field" efficacy of varicella vaccine was recently demonstrated during several outbreaks of varicella in closed communities in the US. Although breakthrough varicella, referred to as modified varicella-like syndrome (MVLS), was observed in both immunocompetent and immunocompromised vaccine recipients, symptoms were usually mild in both. However, the attack rate following household exposure in vaccinated adults was higher than that of vaccinated children. Secondary transmission of vaccine virus in vaccinees developing post-vaccination rashes occurred at a low incidence. The resultant infection in susceptible contacts, including immunocompromised individuals, was mild and amenable to specific antiviral therapy.

No evidence of waning immunity following varicella immunisation was identified by follow-up studies that lasted 20 years and anamnestic cell-mediated immunity (booster response) was demonstrated following either exposure to natural varicella or vaccination.

Vaccinees may present a lower risk for zoster following vaccination because of a lower incidence of viremia and infection of the skin. Less virus is present in the skin to start with to access sensory nerves, the dorsal root ganglion neurons are less susceptible to infection by the Oka strain, and the virus also appears to be less able to reactivate than its wild-type counterpart.

Unlike all other currently available live-attenuated vaccines, the varicella vaccine virus persists in the body of recipients and has a theoretical lifelong latency with intermittent reactivation. The unknown long-term effects of viral persistence could be a concern but such remains unanswerable at this moment. However, it is quite certain that even the wild-type varicella virus has no oncogenic potential and it is likely that the attenuated virus would replicate less well in humans, lessening the opportunity for latency and decreasing the risk for both zoster and hitherto unknown long-term adverse effects.

Long-term vigilant surveillance of vaccinees for waning immunity and late-appearing adverse events is important but so far has been reassuring. The future varicella vaccine preparations are likely to be more immunogenic heat-stable high-titre Oka strain vaccines that have lower breakthrough rates and highly immunogenic when used in combination with other vaccines.

Pertussis beyond childhood

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Pertussis (whooping cough) was first recognised as an epidemic disease in the sixteenth century. It is an infectious illness of the respiratory tract caused by Bordetella pertussis and is a major etiological agent of prolonged cough during childhood in unvaccinated populations. The classical illness is a three-stage illness with catarrhal, spasmodic, and convalescent phases, with a distinctive whooping cough. Its characteristics today are similar to those in the preantibiotic and prevaccine era, when it was a high-incidence endemic disease with cyclic epidemic peaks occurring every 2 – 5 years with a high mortality. Pertussis-like coughing, however, can be caused also by Bordetella parapertussis, Chlamydia pneumoniae, Mycoplasma pneumoniae and adenovirus. Studies in Sweden, a nonvaccinating country, have shown that 60% of all children have had clinical whooping cough before the age of 10 years and another 25% have had asymptomatic or subctinical infection.

Two decades ago, pertussis in adults was a recognised curiosity, but data relating to its incidence and importance were lacking. The universal use of pertussis vaccine in children results in a marked reduction in incidence, but the frequency of disease cycles does not lengthen. This indicates that the organism remains prevalent in the population. About 15 years ago, the breakthrough development and standardisation of the quantitative specific Bordetella pertussis ELISA with pertussis toxin (PT) and other antigens allowed the serodiagnosis of the infection in patients in whom the diagnosis previously would have been missed by microbiological culture which is usually suboptimal. The diagnostic yield can be further enhanced with a direct fluorescent antibody technique and a nested polymerase chain reaction with the PT promoter region as target.

During the last decade, studies of prolonged cough illnesses of longer than 5 days' duration in adolescents and adults indicate that between 12% and 32% are the result of B. pertussis infection, with a significant number of these are mixed infections with other respiratory pathogens. Immunity to B. pertussis illness, whether vaccine- or infection-induced, is not long-tasting. The outcome of repeat infection depends on the time that has elapsed since the previous infection. A short time interval results in asymptomatic infection, whereas a longer duration results in symptomatic disease, with endemic disease in adults being responsible for cyclic disease in unvaccinated children. Serological survey data from the United States and Germany indicate that all adults have been previously infected, and infections in adults are as frequent in the former where pertussis has been controlled, as in the latter where pertussis has been epidemic. It has been reported in the US that about 1 or 2 in 1000 adolescents and adults develop pertussis each year. Recent published data also suggest that symptomatic pertussis occurs in elderly community residents, though severe illness and complications rarely develop.

The schedule for DTP (diphtheria-tetanus-pertussis) vaccine administration at 2, 4, and 6 months of age was designed specifically to protect infants and young children from the high incidence of morbidity and mortality associated with pertussis. Yet the success of this optimal immunisation scheme with cellular pertussis vaccines confers immunity of limited duration to about 80% of recipients, whereas convalescence from disease confers immunity of long duration in all patients. Hence when most individuals have acquired their immunity from vaccination, they become susceptible to pertussis as teenagers and adults and potentially transmit the pathogen to susceptible children, especially the vulnerable young infants who have not yet completed the vaccination. Booster immunisation has been suggested to more effectively control pertussis in all age groups. Whole cell (WC) pertussis vaccines have been available for about 50 years and are regarded as unsuitable for routine use in adults because of reports of frequent moderate to severe reactogenicity at the injection site and occasional systemic reactions. The search for less reactogenic vaccines for use in infants and children ultimately led to the development of acellular (AC) pertussis vaccines, which contain one or more purified proteins of B. pertussis. The safety and immunogenicity of these vaccines when administered to infants have been demonstrated and licensed for immunisation of infants against pertussis. Several AC vaccines have been well tolerated and highly immunogenic when given to healthy adults. This provides us with an opportunity to reconsider booster immunisation of adolescents and adults, which is now regarded as an important component of programmes designed to control pertussis in the population.

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Augmentation of host defences in the treatment and prevention of infectious diseases

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At the 38th Annual Meeting of the Infectious Disease Society of America (IDSA), several aspects on the use of colony stimulating factors (CSF) were highlighted.

To combat infectious diseases, host defence mechanism plays a significant role. A critical element of the response to infection is the capacity to produce and deploy neutrophils and monocytes. This response requires adequate hematopoietic precursor cells and the cytokines, granulocyte-colony stimulating factor (G-CSF) and granulocyte- macrophage colony stimulating factor (GM-CSF). Both of these factors are endogenously produced by a variety of cells, including vascular endothelial cell, fibroblasts and macrophages. Recombinant G-CSF and recombinant GM-CSF have become commercially available.

Neutropenic patients

For patients receiving myelotoxic chemotherapy or hematopoietic transplantation, infections are shown to be prevented by accelerating marrow recovery with recombinant G-CSF or GM-CSF. The use of CSFs, however, does not prevent chemotherapy-induced neutropenia, nor does it have an impact on the frequency of severe infections or on overall survival. G-CSF has also been shown to be effective for prevention of infection in cyclic, congenital and idiopathic neutropenia. There are probably similar benefits for patients with neutropenia due to HIV infection.

Non-neutropenic patients

The use of CSFs in the management of non-neutropenic infections is a fascinating new area. The rationale for this use was derived from the observation that G-CSF and GM-CSF, apart from promoting granulopoiesis, also affect several functional properties of neutrophils such as the oxidative burst reaction. At concentrations considerably below those required for stimulating colony formation, G-CSF and GM-CSF increase the survival time of polymorphonuclear cells and promote tissue infiltration by these cells. In vivo, recombinant G-CSF protects animals against infection in bum sites, peritonitis and against pneumonia; it also protects splenectomised animals against infection. In the 2000 Annual Meeting of the IDSA, recent randomised clinical trials were discussed for the use of G-CSF in hospitalised patients with community acquired pneumonia or multi-lobar pneumonia and in patients with pneumonia with sepsis
syndrome. In humans, recombinant G-CSF does not increase overall survival in community-acquired pneumonia or nosocomial pneumonia. Recombinant G-CSF treatment, however, is associated with a significant reduction in the incidence, extent and duration of organ failure. A recent consensus statement by

the American Thoracic Society supports the clinical evaluation of recombinant G-CSF as a possible adjunct to standard therapy for severe hospital-acquired pneumonia.

Granulocyte transfusion

Use of granulocyte transfusions in the treatment of sepsis with neutropenia declined a few years ago because of inadequacies in leukocyte procurement and the difficulty in obtaining sufficient donors. Interest in neutrophil transfusion therapy recently re-awakened because G-CSF can be used to greatly augment the production of granulocytes from normal donors. Using G-CSF for the donors, sufficient cells can be collected which can be used to normalise the counts and inflammatory responses of severely neutropenic patients. Clinical trials are now undergoing to determine the benefit of this treatment strategy for severe bacterial and fungal infections in neutropenic patients. Initial experience suggests that they may be useful adjuvants for patients who are not expected to have prolonged neutropenia.

Conclusion

Augmentation of host defence mechanism by cytokine therapy is a major research area in modern treatment and prevention of infectious diseases, This kind of therapy is expanding and probably would become a useful tool other than antimicrobial treatment in combating infectious diseases.

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An overview of forthcoming antimicrobial agents

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Introduction

Development of new antimicrobial agents is one of the strategies to combat the ever-changing epidemiology and resistance pattern of infections. In this article, four classes of such agents will be highlighted, namely, ketolides, daptomycin, new azoles and candins.

(1) Ketolides

Respiratory tract infections (RTIs) are among the most common reasons for physician visits and represent a significant socio-economic burden. While a wide range of bacterial pathogens is implicated in the etiology of RTIs, treatment strategies are often empiric, making effective and broad-spectrum antibiotics essential. At present, the preferred agents include beta-lactams (with or without beta-lactamase inhibitors), macrolides, tetracyclines and fluoroquinolones. Emergence of resistance to the currently available antimicrobial agents is a growing problem and cross-resistance among different classes of antibiotics is not uncommon. A novel class of antibiotics, ketolides, was developed against this background, with telithromycin as the representative.

Ketolides are new addition to the macrolide-lincosamide-streptogramin$_B$ (MLS_B) group of antimicrobials. They are semi-synthetic antimicrobials based on a 14-membered macrolactone ring structure. Compared with macrolides, there are two major structural changes: the presence of an 11, 12- carbamate extension and replacement of a cladinose moiety by a 3-keto function. These changes render ketolides a favourable resistance profile, an improved acidity stability and an extended half-life.

Ketolides exert their antimicrobial effects through the inhibition of bacterial protein synthesis. They bind to the 50S ribosomal subunit, indirectly inhibit peptide bond formation by blocking elongation of growing peptide chain. There is also evidence suggesting that ketolides could inhibit the assembly of new ribosomal subunits. Presence of the carbamate side-chain greatly increases the affinity of ketolides to the ribosomal subunits and enhances its potency. Such a phenomenon also enables this agent to overcome the MLS_B resistance. This is due to a mutation that leads to structural change of ribosomes and diminished affinity of binding by macrolides. On the other hand, presence of the 3-keto function appears to be responsible for the lack of MLS_B resistance induction by ketolides.

Telithromycin is the prototype of ketolide antimicrobials. Currently, it is available in oral form with 57% bioavailability. About 60 - 70% of the drug is bound to plasma protein. It is mainly metabolized in liver and the excretion half-life is over 10 hours. It exhibits concentration dependent killing and significant post-antibiotic effect.

The efficacy of telithromycin has been tested extensively from both in vitro studies and clinical trials. It is highly active against the commonly encountered respiratory tract pathogens including multi-resistant S. pneumoniae, H. influenzae, Moraxella catarrhalis, Lancifield group A streptococci, Legionella spp., Chlamydia spp., Mycoplasma spp. and staphylococci. It is active against a wide range of infections from upper to lower respiratory tract.

The recommended regime for telithromycin is 800mg daily for 5 to 10 days. Its side effects include GI upset, diarrhoea, headache, dizziness, and mild elevation of hepatic transaminase level. Sporadic cases of leucopaenia and frank hepatitis were reported which was likely dose related. Significant prolongation of QTc was not reported.

(2) Daptomycin

Daptomycin is a lipopeptide antibiotic. It was developed in mid-80's for the treatment of infection secondary to Gram-positive cocci. However, clinical trials were halted in 1990 because of treatment failures including 2 resistant S. aureus strains. It was thought that high protein binding (> 90%) and lower-than-expected concentrations in serum with the dosage regime of < 3 mg/kg every 12hrs may have contributed to these failures. In light of increasing need for alternative treatments against the resistant Gram-positive cocci, there is revitalized interest in this antibiotic.

This drug acts on the cytoplasmic membrane of the bacteria, disrupts the membrane potential and interferes with cell membrane transport. It also inhibits glycosaminoglycan synthesis. Presence of calcium ions is required for the drug to exert its effects.

Daptomycin is administered intravenously. It is highly plasma protein bound. The plasma half-life is 8.5 hours, and 80% of the drug is excreted in urine unchanged. It exhibits concentration dependent killing and synergy with aminoglycosides is demonstrated in *in vitro* studies. Drug interaction was not reported so far. The previously observed neuromuscular toxicity was worrisome. Currently, it appears that daptomycin has an acceptable safety profile with a once daily dosing, without evidence of serious side effect up to 8 mg/kg.

The clinical efficacy of daptomycin is now being examined under phase III clinical trials. With a dose of 4 - 6 mg/kg daily, either alone or in combination

with other antibiotics, it is highly bactericidal against most Gram-positive cocci. Its activity against resistant micro-organisms like penicillin resistant S pneumoniae (PRSP), methicillin resistant S. aureus (MRSA), vancomycin resistant enterococci (VREs) and glycopeptide intermediate resistant staphylococci (GISA) is equally impressive.

(3) New azoles

Development of antimicrobial resistance among the commonly encountered fungal pathogens and emergence of new fungal pathogens e.g. non-albicans Candida species, Fusarium spp., Zygomycetes spp., etc. clearly call for newer and more potent antifungal agents. In response to this demand, a second generation of triazoles is currently in development. The representatives are voriconazole, ravuconazole and posaconazole. Among these, voriconazole is the one that has undergone more extensive clinical testing.

Voriconazole is a derivative of fluconazole. Like other triazoles, it acts by inhibiting the C-14∝ demethylation of lanosterol. This in turn reduces the level of ergosterol, an essential component of fungal cell membrane. It is available in both intravenous and oral form. Bioavailability of voriconazole is reduced by concomitant food intake, and 58% of the drug is plasma protein bound. Plasma half-life of this drug is around 6 hours, with hepatic metabolism being the major route of excretion. Because of its hepatic metabolism and inhibitory effect on the cytochrome P450 system, drug interaction is a real concern. It causes elevation in blood level of cyclosporin, prednisone and warfarin. On the other hand, omerpazole and phenytoin can elevate blood level of voriconazole, whereas rifampicin and rifabutin can reduce it.

Voriconazole has been tested in both *in vitro* and *in vivo* studies and it is active against most Candida species, Aspergillus species, Cryptococcus neoformans and filamentous fungi. Its side effects include teratogenicity, elevation of liver transaminases, drug rash and transient visual blurring.

Posaconazole is a derivative of itraconazole and it had similar spectrum of activity as voriconazole. This agent has low aqueous solubility and it is available in oral form only. Ravuconazole is another derivative of fluconazole. Compared with voriconazole, it has an extended plasma half-life which makes once daily dosing schedule possible. It also has the distinct advantage of not interfering function of cytochrome P450 and therefore drug interaction is much less frequent.

(4) Candins

The development of candins, a new class of antifungal agent, represents the latest advance in the treatment of fungal infections. It has a distinct mechanism of action: it inhibits the 1,3-β-D-glucan synthase in a non-competitive fashion,

thereby inhibiting the fungal cell wall synthesis. Agents under development include the ecchinocandins VER-002, FK-463, and caspofungin.

Currently, most of the experimental and clinical data are focused on caspofungin. It has a poor oral bioavailability and must be given parenterally. This agent is metabolized by liver and its long plasma half-life allows it to be administered once daily. It is fungicidal to most Candida species and it is fungistatic for Aspergillus. It shows synergism with amphotericin B. Excellent safety profile was demonstrated in clinical trials although drug interaction with cyclosporin was noted which causes elevation of liver transaminases. It has been used for the treatment of Candida-associated oesophagitis and it was at least as effective as amphotericin B. It has also been employed as a salvage therapy for invasive aspergillosis with an overall response rate of about 40%.

Conclusion

A new array of antimicrobials will soon be available and when used judiciously, they will be valuable weapons against the ever-growing challenge of infectious diseases.

Reference

Abstracts from 40th Interscience Conference on Antimicrobial Agents and Chemotherapy by American Society for Microbiology

Recommendations for management of women with suspected or confirmed perinatal infection

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Introduction

Perinatal infection is an area where complexity in management often arises as a result of the requirement for involvement of multiple disciplines. In the year 2000, a Perinatal Infectious Disease Group (including physicians, paediatricians, obstetricians and pathologists) is formed in Princess Margaret Hospital to set up guidelines and to provide multidisciplinary management for perinatal infection. The following recommendations are modified from the guidelines of the Perinatal Infectious Disease Group for general usage.

General advice

Prevention

(1) The immune status of all pregnant women is ascertained during antenatal visit including past history of infectious disease and vaccination history.
(2) Relevant antenatal testing such as rubella antibody titre and VDRL are routinely carried out.
(3) The antenatal and postnatal periods provide good opportunities for health education, e.g. postnatal vaccination is recommended for rubella if the woman is noted to be non-immune, general advise for self care against infectious disease could be provided in various antenatal or postnatal encounters.

Contact with suspected infection

All pregnant women are encouraged to report to their doctors whenever they develop rash or fever or if they have a recent contact with infected suspects. At the mean time, they are advised to stay at home and isolation is recommended till their status is ascertained.

Recommended duration of isolation: (= combination of I and II)

Disease	Incubation period (1)	infectious period(II)
Rubella	14 to 21 days	7days before to 4days after rash
Measles	7 to 18 days	7days before to 4 days after rash
Mumps	12 to 25 days	7days before to 9 days after parotiditis
Chickenpox	10 to 21 days	1 to 5 days before to 5 days after rash

Management of pregnant women presenting with rash

(1) Check specific lgG and lgM.
(2) Antenatal care is best provided in special clinic involving obstetricians and physicians specialised in infectious disease.
(3) If complication is observed, admission into infectious disease ward or isolation ward is recommended.
(4) If the patient is infectious at delivery, isolation in labour ward or operation theatre with special precaution is required.

Notification of disease

Notifiable disease should be reported to the Department of Health once confirmed.

Varicella zoster

Management of immune pregnant woman

If the woman has a previous history of chickenpox, it is reasonable to assume that she is immune to primary varicella zoster (VZ) infection and the woman reassured. However, if there is any doubt, confirmation is recommended.

Management of pregnant woman with non-immune or unknown status

(1) Elucidate the contact history, the infectiousness (vesicular rash or development of rash within 48 hours of contact) and the degree of exposure (face to face for 5 minutes or indoor contact for more than one hour).
(2) If the woman has a significant contact and no previous history of varicella, check varicella lgG in the serum. Reassurance could be given if VZ lgG is positive.
(3) If the woman is not immune, VZ lgG is given as soon as possible, preferably within 72 hours of contact (some evidence of benefit up to 10 days after exposure).
(4) If there is presence of lgM in maternal serum or serological evidence of sero-conversion at < 20 weeks gestation, the woman is informed of the risk of congenital varicella infection (estimated to be around 2%) and is referred for prenatal diagnosis.

Management of pregnant woman presenting with chickenpox

(1) The woman is advised to stay at home. Appropriate follow-up appointment is arranged and contact with other pregnant women is to be avoided.
(2) Hospitalisation is indicated if there is any obstetric complications, respiratory symptoms, dense and haemorrhagic lesions or continuous development of new lesions 6 days after onset. Admission into infectious disease ward or isolation ward is advised.

Indications for intravenous acyclovir

(1) In the second half of pregnancy and within 24 hours after onset of rash, administration of acyclovir may reduce the severity and duration of the illness.
(2) Varicella pneumonia

Precautions in labour

(1) Follow the precautions for airborne infection.
(2) Caesarean section can be carried out in the operation theatre as usual and the anaesthetist is informed. The same theatre should not be used in the following hour to avoid cross infection.
(3) Inform paediatrician before delivery.

Postpartum management

(1) The baby should be under the observation by the paediatrician. The baby could be visited in private room, roomed-in or breast-fed after the mother's lesions have crusted.
(2) The mother is managed in infectious disease ward or in isolation ward. The normal postnatal discharge and follow-up routines are followed.

Prevention of varicella infection in newborns

(1) Infection could be lethal to the baby if maternal infection occurs 4 days before delivery and up to 2 days postpartum. Delivery should be delayed until 5 to 7 days after onset of maternal illness.
(2) If a sibling has varicella when the woman is discharged postnatally, no special treatment is required for lgG positive mother. However, if the mother is not immune, both the mother and the baby should be given VZ lgG.

Rubella

Prevention

(1) All women are advised to be tested for immunity to rubella when they are contemplating for pregnancy. Vaccination before pregnancy is recommended if they are not immune.3
(2) Women are routinely tested during the first antenatal visit. If a woman is noted to be non-immune, contact precautions are advised.
(3) Vaccination and concomitant contraception is recommended for the non-immune after delivery. Vaccination is not contraindicated in breast-feeding women but is not recommended during pregnancy.

Management in pregnant woman non-immune or with unknown status

(1) Rubella lgM with a paired-serum rubella lgG titre is performed as soon as possible. lgG detected within 14 days of contact indicates that the woman has previous rubella infection. Conclusion on susceptibility or immunity to rubella could not be ascertained from past history and must be based on serological examination.
(2) When rubella is acquired in early pregnancy less than 16 weeks, there is a 50-60% chance of congenital malformation. Termination of pregnancy is generally advised. However, there is a risk of fetal abnormalities with rubella acquired at any stage of pregnancy.
(3) Inadvertent vaccination before or during early pregnancy is not an indication for termination of pregnancy.

Management of pregnant woman with rubella infection

(1) Follow the precautions for air-borne infection.
(2) Referral for prenatal diagnosis.
(3) Contact with the newborn should be avoided including breast feeding or visiting nursery.

Syphilis

Prevention

(1) Congenital syphilis can be prevented through antenatal screening and treatment at an early gestation.
(2) The magnitude of the risks to the fetus varies with the stage of untreated syphilis in the mother. The risks include miscarriage, prematurity, fetal hydrops, stillbirth and congenital syphilis.
(3) All women should be screened in early pregnancy, and in high-risk cases, preferably again at 28 weeks.

Diagnosis

1. Non-treponemal tests
   VDRL is also an indicator of disease activity and useful for follow up.
2. Treponemal tests
   FTA-ABS
   MHA-TP

Management of con firmed syphilis in pregnancy

1. At any gestation, parenteral penicillin G is given according to the stage of syphilis as recommended for non-pregnant women.
2. If the woman is allergic to penicillin, erythromycin could be given but is not considered reliable in combating fetal infection. Tetracycline is not recommended in pregnancy. 3
3. Screen for other sexually transmitted diseases (STD).
4. Refer to Social Hygiene Clinic for contact tracing.
5. Referral for prenatal diagnosis.
6. Consult paediatrician after delivery.

HIV

Pre-pregnancy counselling and investigation

1. Counselling and screening for at-risk women.
2. In HIV positive women, counselling is offered on contraception and maternal/fetal risk/prognosis if pregnancy is contemplated.

Management in pregnancy

1. Counselling and screening for at-risk women.
2. Unless proven otherwise, all at-risk women are managed as HIV positive in terms of infection control measures with blood and other body products.
3. For HIV positive women, counselling and options of termination or continuation of pregnancy are offered.
4. Screen for other STD.
5. Monitor CD4+ count serially.
6. Treat opportunistic infection.
7. Use of antiviral e.g. zidovudine
8. Avoid procedures that may cause a breach in maternal-fetal barrier.

Labour/delivery and postnatal management

1. Precautions in handling all blood and body products as non-pregnant HIV women.
2. Caesarean section is the preferred mode of delivery as it may reduce vertical transmission rate by 30%.
3. Avoid fetal blood sampling or use of fetal scalp electrode in labour.
4. Advise against breast-feeding.
5. Advice on contraception.
6. Inform paediatrician for screening and follow up of the baby.

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A case of breast lump

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A 43-year-old lady was referred to surgical unit because of few months history of right breast lump. The mass was slightly tender and measured 2 cm in diameter. There was no increase in size. Eosinophil count was 0.1 x 10/L. Fine needle aspiration cytology of the mass reveal granulomatous inflammation with fragment of parasite. Surgical excision was performed and 2 cm whitish structure was found. Section confirmed parasite with cutis and ova that was consistent with sparganosis.

Discussion

Human sparganosis have been reported worldwide, and is more commonly found in China, Japan and Southeast Asia. It is caused by larval cestodes (tapeworm) of genus spirometra of which the adult worms usually parasitise cats and dogs. Eggs passed from adult tapeworms hatch in fresh water and are ingested by first intermediate hosts Cyclops (minute crustaceans), commonly known as waterfleas. Cyclops are then eaten by second intermediate hosts such as fish, snakes, frogs, etc. Human infection can occur from ingestion of Cyclops through contaminated water, ingestion of flesh of second intermediate hosts, or use of infected hosts such as frogs and snakes as poultices to wounds and eyes. The larvae (spargana) will then migrate in tissues of human and typically invade subcutaneous tissues and joints but also invade visceral organs, orbit of eye, and more rarely the brain. Clinically, sparganosis usually present as subcutaneous nodule with little or no peripheral eosinophilia although occasionally can present with more florid clinical features with fever, constitutional upset, migrating subcutaneous mass, arthritis and eosinophilia.

In this case, the parasite invaded breast tissue and our patient presented with painful breast lump with normal eosinophil count. On questioning the food history, our patient had history of eating raw crab, a custom of her native place (Hui Yang), which was probably the source of the infection.

Surgical removal is the recommended treatment and drug therapy is not effective. To prevent acquiring this rare infection, drinking water should be boiled to prevent accidental ingestion of Cyclops. Ingestion of raw frog, snake, fish or crab should be avoided as well.