A Novel Highly Effective Treatment for Head Lice Infestation

In many regions of the world, pediculosis capitis is an important public health problem. Although head lice infestation is not a health hazard, it can cause great distress to many patients. Insecticides have been widely used for eradication of head lice. Resistance to the presently approved pediculicides has become an important problem in treatment failure. Recent reports have shown effective treatments of head lice using products that have a physical action on lice. These simple methods can be an alternative treatment of pediculosis capitis.

Head lice, *Pediculus humanus capitis*, are obligatory ectoparasites and are endemic worldwide. Infestations often occur in persons of unclean habits. However, all ages and socioeconomic groups can be affected. The infestations are usually more common in girls and women than boys and men. Preschool and primary school children aged 3-11 years old are high-risk groups.

Head lice are wingless insects and have adapted legs with claws for clinging to hairs. Female lice lay 6-8 eggs per day. The freshly deposited eggs or nits are translucent and are cemented to the hair shafts close to the scalp. The nits are ovoid and have a characteristic operculum containing many small perforations. Oxygen is provided through these small holes for the developing embryo. After hatching within 5-10 days, the eggs turn white and more visible. Nymphs and both sexes of the adults feed on their host’s blood every three to six hours. They breathe through spiracles. The spiracular openings are situated in the dorsolateral parts of the thorax and abdominal segments. The lifespan of head lice is about one month. Head lice cannot survive more than 2-3 days if they are away from their hosts.

The common therapeutic options used for pediculosis capitis are topical insecticides and mechanical removal of lice and louse eggs by combing. Various natural and synthetic insecticides are effective against head lice. Pyrethrins and permethrin are neurotoxic to lice leading to paralysis and death, but of low mammalian neurotoxicity. Lindane (gamma benzene hexachloride) stimulates the nervous system of the lice. Treatment with lindane is contraindicated in patients with a history of seizure. Malathion is an organophosphate and has high ovicidal activity. The alcoholic composition of malathion makes it flammable and may cause a stinging sensation. Insecticides are generally considered as ovicidal agents but all eggs may not be killed with just a single dose. Thus, a second application after 7-10 days is suggested. Manual removal of head lice and nits using a louse comb is generally less effective than topical insecticides. It is usually difficult in practice because nits are firmly glued to hair shafts causing removal to be painful. In addition, some lice and nits may be undetected despite careful inspection.

With the emergence of drug resistance and the neurotoxicity of insecticides, new therapeutics of pediculosis capitis have been published. The efficacy of a new treatment using a nontoxic, dry-on, suffocation-based pediculicide (DSP or Nuvo lotion) was assessed by Pearlman. The mechanism of the agent is based on coating the entire exterior of the louse which results in the physical blockage of the spiracle openings of the insect. The overall cure rate was 96% with a 6-month follow-up remission rate of 94%. The cure rates are superior to the best recent efficacy outcomes of treating with permethrin, pyrethrin, lindane, and malathion.

Dimeticone lotion is one of the new products against head lice. This insecticide-free product is not absorbed transdermally. It seems to have less irritant side effects than conventional drugs. *In vitro* studies found that dimeticone causes irreversible immobilization of head lice within five minutes of application. However, it is evaluated to be much less effective than Nuvo lotion.

In comparison to the most recent reports in the United Kingdom, the cure rate of Nuvo lotion is superior to permethrin (10%), malathion (17%), Bug basting or wet combing with conditioner (57%), phenothrin (75%), and dimeticone (73%). Initially, Pearlman did not reveal the actual name and compositions of Nuvo lotion. After more than 250 requests from practitioners for additional treatment information, the lotion was subsequently announced to be Cetaphil™ cleanser (distributed by the Galderma Laboratories). On its label, the formulation includes cetyl alcohol, propylene glycol, sodium lauryl sulphate, stearyl alcohol, and preservatives. This product is available in Thailand.

Cetaphil™ cleanser is a novel highly effective treatment for pediculosis capitis. The suffocating action of the agent is unaffected by the resistance developed to traditional insecticides by head lice. This new product is a non-neurotoxic pediculicide and seems to be a practical treatment against head lice infestations.

REFERENCES

Empiric Treatment for MDR-TB

Multidrug-resistant tuberculosis (MDR-TB) is a threat to global control for one of the most dangerous infectious diseases. It is defined as a strain of *Mycobacterium tuberculosis* which resists to at least isoniazid and rifampicin. The prevalence of MDR-TB among new cases of tuberculosis in Thailand is 2.02%. Under the 2003 World Health Organization (WHO) treatment guidelines, previously treated patients in whom the standard short-course chemotherapy (Category I, 2 HRZE / 4 HR) fails will be assigned to Category II (2 SHRZE / 1 HRZE / 5 HRE), the beginning numbers are duration of treatment in months; and, H = isoniazid; R = rifampicin; Z = pyrazinamide; E = ethambutol; S = streptomycin. Data from Thailand and other countries have shown that most Category I failures also failed in Category II, and most of them have MDR-TB. The quest for alternative regimen to Category II for Category I failures is clearly needed.

At present, the resources for drug susceptibility testing (DST) in Thailand may be sufficient. Patients likely to have MDR-TB should be triaged into effective MDR-TB therapy. Such an approach will reduce the interval of infectiousness and improve cure rate in MDR-TB patients. The experience in standardized empiric treatment for MDR-TB patients in Thailand has been firstly launched in the year 1995. Although our empiric regimen has some differences from those previously described, this empiric treatment strategy is still effective in our settings and appropriately defined patients.

Empiric treatment for MDR-TB should be considered in those failed in Category I under directly observed treatment (DOT) or confirmed good compliance in non-DOT. Retreated patients with severe form of tuberculosis such as dissemination or respiratory failure should also be observed.

The proposed regimen is 4 S POEZ / 2 POEZ / 12 OEZ(P), where the subscript number for S is once daily injection five times a week (preferred Monday to Friday); and, P = para-aminosalicylic acid or PAS; O = ofloxacin; E = ethambutol; Z = pyrazinamide. Ofloxacin can be safely administered with the once daily dosage of 10 mg/kg.

After the results of pretreatment DST are available, regimen adjustment along with clinical response consideration may be as follows:

1. If the strain is sensitive to E and Z, P can be discarded.
2. If E or Z is resisted, but patient has good clinical response, empiric regimen should be maintained with closely observed response for failure.
3. If R is not resisted, regimen should be adjusted by using 3 sensitive drugs from DST and continued for a total of 12 months.

Patients in whom empiric treatment were assigned should have highly supervised treatment under DOT or other effective registration and follow-up systems. Sputum smears and cultures should be continued monthly until the smears are negative, and then every 3 months for surveillance. Those who have rapid conversion to negative and maintain until 6 months of treatment will have a favorable outcome. Chest radiographs should also be followed at 3 and 6 months after treatment, if good clinical response is achieved, it should be performed once at the end of the regimen.

**REFERENCES**

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