Readers' Forum

Are Mosquito Repellants Safe?

Q. *Commercially available mosquito repellants contain DEET (N.N-diethyl-m-toluamide). A prolonged exposure to DEET in children can result in toxic encephalopathy. What is the exact mechanism of inducing central nervous system toxicity by DEET? Further, is it safe to use the available mosquito repellants in children, particularly infants? Should we as pediatricians not recommend mosquito nets instead?*

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A. The resurgence of malaria, particularly chloroquine resistant *P. falciparum* and vector resistance to cheaper insecticides such as DDT has led to a renewal of interest in various methods to reduce human-vector-contact.

The use of insect repellants is an effective and popular method of protection from mosquitoes. DEET (N.N-diethyl-m-toluamide) is one of the most commonly used mosquito repellant. As the duration and range of protection depends on the concentration of DEET, products containing lower concentration of DEET have to be applied more frequently to be effective. This has led to the manufacture of highly concentrated products with upto 100% DEET, even though lesser concentrations of DEET have been found to be sufficient for protection against mosquitoes. The new controlled release formulations provide long lasting protection at a much lower % of DEET (33-50%).

DEET is absorbed through intact human skin and being lipid soluble, could accumulate in the brain. Penetration of 9-56% of topically applied dose with absorption of about 17% into the circulatory system is reported(l). Since small children have a larger surface area-to-mass ratio when compared with adults, greater topical cutaneous absorption is likely.

How safe is DEET when used as recommended, when used frequently and excessively or when ingested in overdose? Preparations containing less than 50% DEET are generally safe and free of side effects when applied to the skin of adults although there have been occasional reports of contact urticaria and anaphylaxis. In children however, encephalopathy has followed the repeated application of upto 20% DEET; slurred speech, staggering gait, agitation, tremors, convulsions and death have resulted(2). Ingestion of DEET can cause severe toxic reactions and death(3). The toxic action of DEET is mainly due to its accumulation in organs leading to suppression of their functions, mainly of the CNS. Excitation of the CNS manifesting as seizures could be due to neurotoxicity by release of neurotransmitters or accumulation of ammonia(4).

The safety of insect repellants has rightly been questioned. Use of repellants containing more than 50% DEET should be avoided in infants and young children. Frequent and extensive applications even of lesser concentrations of DEET should also be avoided. Moreover as soon as the repellant is no longer needed, the skin should be cleaned with mild soap and rinsed with water (1).

Pyrethrum derivatives are now widely used in mosquito coils and mats, and their effectiveness has been documented. Although considered of GRAS (generally recognized as safe) category by FDA(5), there are some reports of toxicity in human subjects on contact or inhalation. There are also indications that they may possess mutagenic and genotoxic potential(5). Mosquito nets have been used for years if in perfect condition, they can prevent 90% of mosquito bites. 'They are most effective when the user is inside a properly hung and tucked-in net during those late night-early morning times when most anopheline mosquitoes are likely to bite.

Furthermore, if these nets are impregnated with mosquito repellants or insecticides, like permethrin then they can additionally reduce vector density in the community, and provide benefit to others in the same house not using nets, by killing and repelling mosquitoes(6). Although, their efficacy has been demonstrated in a number of trials, feasibility of their use on a mass-scale still needs to be established. Nevertheless diligently used mosquito nets appear to be the safest way to keep mosquitoes away.

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Readers' Forum

Role of Ketotifen in Bronchial Asthma

Q. *We are using the drug Ketotifen, a mast cell stabilizer and antihistamine as a preventive drug in allergic type of bronchial asthma How long do we have to use this drug? In children, which is the preferred drug for prophylaxis of asthma, Ketotifen or sodium chromoglycate inhaler?*

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A. Ketotifen has been used in prophylaxis of bronchial asthma for variable periods ranging from 16 weeks to 2 years. The current consensus is that disodium chromoglycate is superior to Ketotifen. Many controlled studies have shown that Ketotifen is no better than placebo. In our own study too, we did find that disodium chromoglycate was effective in more children as compared to Ketotifen.

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Readers' Forum

Tuberculin Test After Therapy

Q. *What is the role of tuberculin test after completing antitubercular therapy? Shall we do it or not?*

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A. The "Tuberculin Test" after completing anti-tubercular therapy is going to be positive, rather the degree of induration will be more as compared to the original reading before start of therapy. There is no need for repeating the tuberculin test after completing the anti-tubercular therapy. The parameters which need to be monitored are fever, weight gain and general well being of the child along with X-ray chest. X-ray chest should preferably be done every three monthly for the first year and every six monthly for the next two years.

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NOTES AND NEWS

YOUNG INVESTIGATORS' AWARD

Dr. B. Sharda, Associate Professor in Pediatrics, R.N.T. Medical College, Udaipur is the recipient of this award for the 10th Asian-Pacific Congress of Gastroenterology and the 7th Asian-Pacific Congress of Gastroenterology and the 7th Asian-Pacific Congress of Digestive Endoscopy held in Yokohama, Japan on September 19-23, 1996 for his paper titled "Changing Trend of Hepatobiliary Disorders in Infants and Children". Heartiest congratulations from the pediatric fraternity.