

Evaluation of Sumithrin® 0.4% Powder against Head Lice

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บทคัดย่อ

สารซุมิทริน หรือ ดี-ฟีโนทรินเป็นสารไพเรทรอยด์สังเคราะห์ สามารถใช้กำจัดเหาได้และมีความเป็นพิษต่อสัตว์เลือดอุ่นต่ำ เมื่อปี 2527 กองกวีวิทยาทางแพทย์ได้นำมาใช้กำจัดเหาให้นักเรียนในโครงการสำรวจภาวะการเป็นเหาของเด็กนักเรียนชนบท และได้ประเมินผลการใช้สารนี้ โดยแบ่งนักเรียนเป็น 2 กลุ่ม กลุ่มแรกใช้ยากำจัดเหา 4 ครั้ง ทุกๆ 3 วัน กลุ่มที่สองใช้ยากำจัดเหา 2 ครั้ง โดยใส่ซ้ำในวันที่สิบ ผลปรากฏว่ากลุ่มแรกนักเรียนหายจากการเป็นเหาทุกคน กลุ่มที่ 2 หายจากการเป็นเหาร้อยละ 81 แสดงว่าในการใช้ซุมิทรินกำจัดเหานั้นต้องใส่ยาซ้ำๆ กันหลายครั้งกว่าไข่เหาจะฟักเป็นตัวหมด ซึ่งใช้เวลาประมาณ 10 วัน

Abstract

Sumithrin® (d-phenothrin) is a synthetic pyrethroid insecticide which has low toxicity to warm blood animals. The Division of Medical Entomology had used it for the treatment of head lice in the 1984 project entitled "Survey of pediculosis among schoolchildren in the rural areas of Thailand". The students with head lice infestations were arranged into two groups for treatment. First group, the treatment was repeated 4 times at every 3 days interval. The second group, the treatment was done twice on the first day and the tenth day. The results showed that all of the girls under the first group of treatment and 81 percent of the second group were freed from head lice. It was concluded that repeated treatment was necessary for effective control because Sumithrin® had little ovicidal effect.

Keywords

Sumithrin, head lice, *Pediculus humanus capitis*

Introduction

Head louse is a blood sucking insect. They suck blood for long period of time but do not ordinarily become engorged. Adults and nymphs of head lice are found primarily on hair and scalp, they tend to be most prevalent on the back of the neck and behind ears. They cause pediculosis outbreaks among children. For head lice control, the safest and best material are emulsions or dusts containing pyrethrins, lindane, benzyl benzoate and malathion¹.

During 1981-1984 the Division of Medical Entomology carried out a project entitled "Survey of pediculosis among schoolchildren in the rural areas of Thailand"². Along with the survey activities in 1984, Sumithrin[®] which is synthetic pyrethroid was used for the treatment of head lice. Because of its low toxicity to mammals and promising control activity compared to other pediculocides used in public health, it therefore has been considered for control head lice at present and future time. The LD₅₀ in mammals by subcutaneous and dermal administrations have shown more than 10,000 mg/kg. It was also shown that no irritation to rabbit eyes and skin occurred³.

This paper is to report the result of Sumithrin[®] against head lice among schoolgirls in the rural areas of Ratchaburi, Nakhon Pathom provinces and suburban of Bangkok.

Materials and Methods

Sumithrin[®] 0.4% powder (3 phenoxy-benzyl d-cis, tran chrysanthemate) was kindly supplied to the Division of Medical Entomology by Sumitomo Chemical Company Ltd. Its physical appearance was fine white powder, packing in brown plastic bottle containing 30 gms., each bottle has a plastic screw cap with small holds for applying by squeezing.

The students with head lice infestation were arranged into two groups for treatment and observation of effectiveness. First group, the treatment was repeated 4 time at 3 day intervals. The second group, the treatment was done twice on the first day and the tenth day, respectively. The average quantity of Sumithrin[®] powder used was approximately 2.4 gms/head/treatment.

The criteria for evaluation of effectiveness was classified into 3 levels: 0 means neither egg nor louse detected after extensive hair combing; 1⁺ means few eggs or 1-5 lice were found; 2⁺ means numerous eggs or more than five lice were found.

Results

Table 1 shows that among 623 schoolgirls in 2 schools of Nakhon Pathom and suburban of Bangkok, 178 or 28.6% were found positive for head lice and under the first group of treatment, 146 out of 178 girls who received regular treatments were completely negative. The results of second group of treatment is shown in Table 2, 120 out of 264 girls or 45.4% from schools in Ratchaburi province were positive for head lice. After treatment, 81 out of 100 or 81% were found negative, only 10% remained 1+ and 9% remained 2+.

Table 1 Results of Sumithrin® 0.4% powder against head lice among schoolgirls in the rural areas of Thailand. (Applied Sumithrin® every 3 day during 10 days course)

School location Date	Total schoolgirls	Pre- application			Post-application				
		Total positive	+	++	Absent subjects	Total positive	+	++	Remarkable improvement
Wat Sai School Nakhon Chaisri district Nakhon Pathom province 24 Jan. - 2 Feb. 84	249	124 (49.8%)	28 (11.3%)	96 (38.5%)	24 (19.4%)	-	-	-	100 (100%)
Wat Chang Lek Talingchun district Bangkok. 20 Feb. - 1 March 84	374	54 (14.4%)	33 (8.8%)	21 (5.6%)	8 (14.8%)	-	-	-	46 (100%)
Total	623	178 (28.6%)	61 (9.8%)	117 (18.8%)	32 (18%)	-	-	-	146 (100%)

Discussion

Sumithrin® was shown to be effective for treatment of head lice. The treatment period on the hair and powder exposure time was 1 to 2 hrs. There is no need to wet hair before application of the powder, and the children can continue their study until the time for washing hair with water or soap. Comparing to Benzyl benzoate, commonly used for treatment of head lice, it takes time overnight for effective results.

Another fascinating action of Sumithrin® is that it has not only killing but also repelling or flushing effect. That means an application of Sumithrin® on hair at a short period, adults and all nymphal stages would be crawling out from their hiding places.

Repeated treatment is necessary for effective control of head lice since Sumithrin® has little ovicidal effect. In case of high louse infestation and high percentage of pediculosis among children especially in school, the sequential treatment for 3-4 times during 10 days interval is necessary.

Though pediculosis is not considered as a serious public health problem, it indicates poor personal hygiene and poverty of the community. Our previous studies revealed that children with high pediculosis were usually from poor families, their parents had no time to pay much attention to the children.

In consideration for routine control head louse among school children, health teachers in each school are responsible for the control as well as their routine teaching. Continuous supplying them with effective, easy using and safety pediculicide will be the essential tool for reducing the distribution of pediculosis among school children in rural areas of the country.

Table 2 Results of Sumithrin® 0.4% power against head lice among schoolgirls in the rural areas of Thailand. (Applied Sumithrin® 2 times on the 1st day and 10th day)

School location Date	Total schoolgirls	Pre- application			Post-application				
		Total positive	+	++	Absent subjects	Total positive	+	++	Remarkable improvement
Wat Tungnoi School Muang district Ratchaburi province 16, 26 July 84	69	19 (27.5%)	17 (24.6%)	2 (2.9%)	-	2 (10.5%)	-	2	17 (89.5%)
Wat Nongkratum School Muang district Ratchaburi province 16,26 July 84	74	35 (47.3%)	26 (35.1%)	9 (12.2%)	4 (11.4%)	5 (16.1%)	2 (6.4%)	3 (9.7%)	26 (83.9%)
Wat Ratsamanchun School Paktho district Ratchaburi province 17, 27 July 84	78	49 (62.8%)	32 (41%)	17 (21.8%)	13 (26.5%)	10 (27.8%)	6 (16.7%)	4 (11.1%)	26 (72.2%)
Wat Posri School Paktho district Ratchaburi province 17, 27 July 84	43	17 (39.5%)	5 (11.6%)	12 (27.9%)	3 (17.6%)	2 (14.3%)	2 (14.3%)	-	12 (85.7%)
Total	264	120 (45.5%)	80 (30.3%)	40 (15.2%)	20 (16.7%)	19 (19%)	10 (10%)	9 (9%)	81 (81%)

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