

TREATMENT OF HEAD LICE INFESTATION WITH BENZYL BENZOATE AND PYRETHRUM

By Uma Rajan

SYNOPSIS

A study was conducted among 300 Primary school children in order to observe the effectiveness of Benzyl Benzoate and Pyrethrum on Head Lice infestation. The results indicate that though both are equally effective against Head Lice, Pyrethrum is the drug of choice as it has fewer side effects.

INTRODUCTION

Head Lice infestation is rather common among our school children especially in the rural areas. The usual method of control relied upon has been a combination of Health Education on personal hygiene measures and a reliable pesticide to destroy both the live lice and the 'nits' (eggs). Since the withdrawal of Gamma-Benzene Hexachloride as a pesticide for the control of Head Lice infestation, some doctors substituted Benzyl Benzoate while others used plain kerosene. Benzyl Benzoate is better known as an acaricide, being the drug of choice in the treatment of Scabies. It has also been used as a pediculicide, but as it is not an efficient ovicide, re-infestation may occur. It is however said to have a softening effect on the egg-shell, so that the egg loosens its hold on the hair. Pyrethrum belongs to the group of organic insecticides of natural origin. The extract pyrethrin comes from the dried flower seeds of *Chrysanthemum cinerarinofolium* (Compositae). The 'pyrethrin' content is in essence an approximately equal combination of 2 group of esters viz:—

- (I) pyrethrin I and cinerin I
- (II) pyrethrin II and cinerin II

These esters are responsible for the pesticidal activity. Pyrethrum is a toxic contact poison which acts rapidly on the pest's nervous system producing muscular excitability, convulsions and paralysis. However, the effect is not very persistent and stable.

Faced with the problem of choosing the most suitable pesticide for Head Lice, it was

decided to study the effect of Benzyl Benzoate emulsion 25% and Pyrethrum Lotion 0.165% on a sample of our school children with the infestation. The main objective of the study being to select the one *with greater effect and lesser side effects*.

Method of Study

A total of 300 school children with Head Lice infestation were selected for the study. A sample size of 150 each to be treated with either sample A (Benzyl Benzoate) or B (Pyrethrum). This sample size was chosen owing to the limited supply of Pyrethrum available for the study, 150 being the maximum number that could be accommodated.

Children in 3 Primary schools were screened by School Health Medical Teams. Those with Head Lice infestation were included in the study, irrespective of age, sex, race or primary class level they were studying in. In addition children referred by any of the other School Health teams to Institute of Health School Clinic for treatment of Head Lice infestation were also included in the study. More than 300 school children were initially accepted for the study in anticipation of default in the follow-up examination. Finally, the first 150 in each sample to complete the follow-up examination were considered in the study.

A questionnaire was designed to obtain certain relevant details pertaining to Head Lice infestation. Most of the information was on personal details and on factors that could help to transmit lice infestation.

Some of the factors likely to affect head lice infestation and transmission are:—

- the length of hair,
- the use of oil, soap or shampoo,

UMA RAJAN, M.B., B.S., D.P.H., Registrar, School Health Services.

- the use of a Chinese comb to remove live lice,
- the habit of sharing combs, towels or bedding,
- the frequency of washing hair,
- details rewashing of linen.

In this regard:—

- 'short hair' refers to length of hair above shoulder level,
- 'Chinese comb' refers to the close-toothed-wooden comb.

Special instructions were also drawn up for distribution to the children. They were written in English and Malay and contained details on the method of application of the pesticide. Both pesticides had to be used in the same manner.

A team of nurses were specially chosen to participate in the study. They were briefed on the various aspects of the study and instructed as to the manner of interview required, and they filled up the questionnaire for each child. In order to ensure that in the follow-up examination no child with live lice persisting after first application was missed, nurses with experience in this field were selected to conduct the follow-up examinations.

After screening and selection of those for the study, the children and their parents were

interviewed and all particulars in the questionnaire filled in. For the younger children, the parents too were called up, i.e. from Primary 1 to 3. All were briefed on the mode of application of the pesticide. The children were given pesticide A and B alternately to ensure random distribution of the pesticides. They were given an appointment date one week later for follow-up examination and instructed to bring along their own small towels and Chinese combs. They were also instructed to refrain from sharing towels, combs and bedding, and to wash and comb their hair regularly, to overcome the possibility of re-infestation. The children were asked to report any untoward reactions of the applications.

At the follow-up examination the children were given a thorough combing and those with at least one live louse combed out were asked to apply the pesticide a second time. Any family desirous of treating other family members were given extra supplies of the pesticide.

All the particulars in the questionnaire were analysed and tabulated.

RESULTS

Analysis of the information obtained from the questionnaire is presented below in Tables I, II, III and IV.

TABLE I

A BREAKDOWN OF INFORMATION ON PERSONAL DATA, AMONG CHILDREN WITH HEAD LICE INFESTATION, IN SAMPLES A & B

	Short Hair	Use Oil	Wash Hair More Than 3 Times Per Week	Use Shampoo	Use Soap	Use Chinese comb
Sample A	72.6%	71.0%	69.3%	52.0%	45.3%	65.3%
Sample B	78.0%	66.0%	78.6%	46.0%	47.3%	60.6%

TABLE II

BREAKDOWN OF DETAILS ON PERSONAL HYGIENE, AMONG CHILDREN WITH HEAD LICE INFESTATION, IN SAMPLES A & B

	Shares Comb	Shares Towel	Shares Bedding	Wash Linen at Home	Wash Linen More Than 1/Month
Sample A	72.0%	68.0%	79.3%	84.0%	61.3%
Sample B	74.6%	68.6%	70.0%	91.3%	76.0%

TABLE III
COMPARISON OF THE EFFECTIVENESS OF PESTICIDES A AND B ON HEAD LICE

	Sample Size	No. without live lice after 1st application	Effectiveness
A	150	134	89.3%
B	150	135	90.0%

TABLE IV
PRESENCE OF REACTIONS FOLLOWING APPLICATION OF 'A' AND 'B'

	Sample Size	Number with Reaction	%
A	150	46	30.66
B	150	27	18.00

DISCUSSION

The personal particulars of the school children shown in Tables I and II clearly indicate that many factors which are known to affect Head Lice infestation and its transmission, and which could therefore influence the results of the study were comparable between the two groups A and B.

The effectiveness of both pesticides A and B is extremely similar, A giving 89.3% and B giving 90.0% effectiveness.

As both pesticides are equally effective against the Head Lice we have to favour the one with less side effects for use as the routine pesticide for treatment of Head Lice infestation in children. From Table IV we can see that the reactions are significantly higher in those who used 'A' i.e. Benzyl Benzoate. Though these reactions were rather minor, like smarting or burning sensation, and itchiness, we have to note that in the choice of a suitable pesticide for treatment such reactions may be of some importance to children in particular. Hence the final choice is pesticide 'B', i.e. Pyrethrum.

WHO reports that though powders and dusts can be used to control head lice, liquid shampoos are preferred for aesthetic reasons. Various pesticides have been used in other countries e.g. in Israel an emulsion containing 0.5% of deodorized Malathion, and in Europe tinctures of derris root (rotenone) and delphinium flowers have been found satisfactory for delousing school children. Pyrethrum powders quickly stop louse activity, unlike DDT which stimulates activity. Hence Pyrethrum helps to decrease itchiness of the scalp.

In our study too, we note that there is much less reaction with Pyrethrum. Pyrethrum is known to kill both the lice and the nits. Benzyl Benzoate only kills the lice but not the eggs. Instead it softens the egg shell causing it to loosen its hold on the hair. In our study the children were instructed to wash and comb their hair as often as possible during the 8 days following first application. This may be the reason for the rather similar results obtained for both Benzyl Benzoate and Pyrethrum in relation to effectiveness.

But louse control methods should be a 2-pronged attack on those already infested and those prone to infestation. Methods of control for infested people should combine delousing methods with pesticides and health education. Measures to delouse family members, proper laundering of bedding, furniture linen and clothes must be stressed. A public health education programme should be planned to teach people to first recognise lice infestation, realise the importance of preventing infestation, understand the methods of transmission and re-infestation, and finally learn to apply preventive and control measures for themselves and the community. The importance of early recognition and treatment of lice infestation and then of preventing further re-infestation and transmission should be the main aim of such a programme.

ACKNOWLEDGEMENTS

My grateful thanks to the following:—

1. D.D.M.S. (Hospitals), for his permission to publish this article.

2. Dr. Connie Lim, Senior Health Officer-in-charge of School Health Services for her encouragement and permission to conduct this study.
 3. Dr. Ho Beng Chuan and Dr. Mulkit Singh, Senior Lecturers of the Department of Parasitology, University of Singapore for their advice and help.
 4. Mrs. Peggie Chia, Pharmacist, School Health Services for her invaluable help and advice.
 5. The Doctors, Nurses, Dispensary and Clerical Staff who so willingly helped to conduct the study.
 6. Miss Karamjit Kaur for typing the script.
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