Iranian Journal of Clinical Infectious Diseases
2010;5(4):213-217

ORIGINAL ARTICLE

Effective health education program on reduction of tinea capitis; A quasi-experimental study on primary school-aged children

Mona Sadat Ardestani[1], Farkhondeh Amin Shokravi[1*], Fatemeh Rakhshani[3], Zeinab Gholamnia shirvani[2]
[1]*Department of Health Education, Tarbiat Modares University, Tehran, Iran*
[2]*Department of Health Education, Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran*
[3]*Department of Health Education, Faculty of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran*

ABSTRACT

Background: This study intends to evaluate the effect of health education program on healthy behavior and tinea capitis in Chabahar primary school-aged boys.

Patients and methods: For this quasi-experimental (case–control) study, two primary schools were randomly selected in Chabahar, south-eastern of Iran. Initial data of 115 students were gathered using a well-prepared questionnaire, by means of a check list and a thorough clinical examination. Meanwhile, scalp and hair samples (direct slide exam and culture) were assessed. Subjects of the experimental (case) group had received necessary educations for one month after which both groups were evaluated 2 months later.

Results: Totally, 20% and 18.3% of cases and controls were infected before conducting the educational program, respectively, however, following the education only 5.5% of cases were remained infected (p=0.008). Pre- and post-education infection rate did not differ significantly.

Conclusion: Our results showed that health education program had a positive effect on reduction of tinea capitis among prepubescent boys.

Keywords: *Tinea capitis; Health education; Prepubescent boy*.
(Iranian Journal of Clinical Infectious Diseases 2010;5(4):213-217).

INTRODUCTION

Superficial fungal skin infections (dermatophytosis) caused by *dermatophytes* are known as tinea and will have a specific name depending on body location as in tinea capitis (1). Dermatophytosis is still being considered as one of the major public health problems in many parts of the world (2) and now affects more than 20-25% of the world's population (3).

Tinea capitis has a high prevalence in tropical area and warm climate (4-6). Tinea capitis is the most common dermatophyte infection in children especially in primary school-aged boys. This infection may damage the hair follicle leading to secondary cicatricial alopecia (7-10). In Iran, the same age group is more commonly affected (11,12, 2,4). Tinea capitis is a public health problem because of its transmissibility and damage of beautifulness (13).

Despite the benign curable nature of the disease, inter-human transmission of tinea capitis is nevertheless a considerable public health problem

Received: 16 July 2010 *Accepted*: 22 October 2010
Reprint or Correspondence: Farkhondeh Amin Shokravi
Department of Health Education, Faculty of Medicine, Tarbiat Modarres University, Tehran, Iran.
E-mail: amin_shokr@yahoo.com

due to the increasing number of children affected and the risk of contagion in schools (10). Dermatophyte infections are associated with high costs (14).

The Prevalence of tinea capitis was higher in children with poor hygiene, male gender, low level of parental education and overcrowded living conditions (15-17). Prior investigators implied that successful management of tinea capitis requires adequate education, correction of underlying predisposing factors, and prophylactic measures against recurrence (18-21,9,10).

Although epidemiological and etiologic studies regarding the tinea capitis have been achieved adequately, scanty reports are available with respect to the effect of health education on disease control. Therefore, it is necessary to investigate the role of health education in reduction of fungal infection.

PATIENTS and METHODS

This research is a quasi-experimental study which was conducted during 2008-2009. Sample size was calculated with an estimation of 10% falling to be 47 students in each group.

Having randomly selected 2 primary schools in Chabahar, a total of 115 boys were assigned in 2 groups of case (intervention) and control, 55 and 60 boys, respectively. Children and their families were living under similar cultural and social conditions. Data were collected at baseline by a well-prepared questionnaire. Tinea capitis confirmed mycologically by microscopy and culture (8). Physical examination revealed that the children had clinical lesions compatible with tinea capitis (22). Having examined the scalp, samples were taken by scraping, then put in 10% potassium hydroxide and cultured on Sabourauds dextrose agar containing cycloheximide and chloramphenicol. After the incubation, final identification was made by macroscopic and microscopic examination of the fungal culture.

After collecting the data, contents of education was prepared. This plan was involved the most important persons in children's life (teacher and mother). Thus, in one session the teachers and mothers of case group separately were being aware about the research and disease. An educational intervention was implemented in the case group. Eight sessions were conducted by health educator and the teachers. Health education outlines generally included tinea capitis characteristics, transmission ways, symptoms, signs and complications, preventing methods and treatment. Duration of each section was 30 minutes.

The educational materials consisted of pamphlet, pictures and photographs, lectures, role playing, demonstration, and face to face interviews. In the control group no intervention was achieved. Data were re-collected 2 months following the intervention by the same tools that were applied at base line. Finally, data analysis was conducted by Mann–whitney, Wilcoxon, and Mc-Nemar tests, when appropriate.

RESULTS

The results showed that there was significant difference between the practice concerning tinea capitis infection in pre- and post-educational intervention in the case group. In the experimental group only 3.6% had good practice about the control of infection and do personal hygiene before the education, while 61.8% after educational intervention practiced well ($p<0.0001$). However, in control group there was no significant increase in practice after the intervention ($p=0.686$) (table 1).

Table 1. Percentage of practice scores of tinea capitis in both groups before and after health educational program

	Before			After		
	poor	**medium**	**good**	**poor**	**medium**	**good**
Case	83.6	12.7	3.6	14.5	23.6	61.8
Control	78.3	18.3	3.3	75.0	21.7	3.3

When evaluating behaviors separately, hair cutting showed maximum increase while not doing interaction with soil in school yard represented the least change. Nevertheless, improvement of all behaviors after education was significant ($p<0.0001$, table 2).

Table 2. Percentage of each healthy behavior in case group before and after health educational program

Behavior	Before		After	
	Yes	No	Yes	No
Using own facilities	20	80	58.2	42.8
Bathing regularly	18.2	81.8	54.5	45.5
Cleaning the clothes	14.5	85.5	54.5	45.5
Cutting hair regularly	20	80	56.4	43.6
Paring nails regularly	28.2	61.8	72.7	27.3
Using private chair in the school	63.6	36.4	100	0
Not interacting with soil in school	0	100	27.3	72.7

Tinea capitis was estimated respectively 20% and 18.3% in the case and control group before performing health education program. Rate of infection decreased to 5.5% in the experimental group after intervention ($p=0.008$, table 3) but Mc-Nemar test showed no remarkable difference in control group ($p=1.000$).

DISCUSSION

Tinea capitis is the most frequent fungal infection in boy's school under the age of puberty and transmitted by human, animal and soil (10). High prevalence of disease in schools makes it a considerable problem in endemic area (23).

Considering the high prevalence of tinea capitis (15%) among boy students in Chabahar city, the present study was designed to evaluate the controlling strategies.

In order to decrease infection, improvement health condition, promotion the knowledge of people, and do the individual health behaviors are recommended (4).

Prior investigators showed that being aware of tinea capitis through individual health behaviors and control the risk factors might be associated with proper disease control (20,24-26).

In this study the compiled health education intervention had a positive effect on the practice in the students concerning tinea capitis which finally led to reduce infected children. A research found an association between the presence of dermatophytosis infection and the habit of hygiene (16).

Our program engaged mothers in educational process and improved healthy behavior.

Using informed and native instructor and conformity of health education program with culture and traits of students influenced positively on practice regarding prevention and control of infection. Obviously, families pay attention to cure their infected children after performing educational program. Meanwhile, another study pointed out that health education should focus on the etiology, treatment and prevention of tinea capitis (9) while treatment of any pediatric dermatophyte infection necessitates evaluation and education of the entire family (27).

During the intervention no treatment modality has been performed, however, subjects of the case group might seek further medical advice since they were more sensitive. Therefore, it may decrease the rate and the level of the infection.

Having completed educational intervention, hair cutting was by far the most prevalent change, however, few students concerned about interaction with soil in school yard.

Ayanbimpe believed that the high prevalence of tinea capitis may be attributed to the frequent interaction with soil and animals and low level of health education on personal and environmental hygiene (28).

It seems that the entire strategy (engaged children, mothers, and schools in the program) by simple and achievable materials with respect to the shortage of facilities in Chabahar would be suitable. Feuilhade believed that tinea capitis is a public health problem and better education would

be a more appropriate response to the problem (10). However, other studies believed that a preventive health education program to eradicate the infection is necessary (19,20).

Therefore, health education program to control health problem among school students, their families and school staff is recommended. Meanwhile, school health departments must be encouraged to further investigate the risk factor among students. Dolenc suggested consistent and integrated efforts of medical and veterinary services associated with health education are required in future to eliminate further spread of dermatophytosis (29).

ACKNOWLEDGEMENT

This research was partially supported by Mycology Laboratory in Tarbiat Modarres University and Zahedan University of Medical Science, International University of Chabahar and, of course, Dr. Izadi.

REFERENCES

1. Mohammedamin JC, Vander Wouden S, Koning FG, Schellvis LWA, van Suijlekom-Smit BW. Reported incidence and treatment of dermatophytosis in children in general practice: a comparison between 1987 and 2001. Mycopathologia. 2007;164:271-78.

2. Aghamirian MR, Ghiasian SA. Dermatophytoses in outpatients attending the dermatology center of Avicenna hospital in Qazvin. Mycoses. 2008; 51(2):155-60.

3. Bassiri-Jahromi S, Khaksar AA. Epidemiological survey of dermatophtosis in Tehran, Iran, from 2000-2005. Indian J Dermatol. 2009;75(2):142-47.

4. Amirrajab N, Rafiei A, Omidian M, Mapar M, Yaghoobi R, Rasaee S, et al. Tinea capitis in Ahvaz. Infectious Disease and Tropical Medicine Journal. 2007; 12(37):71-75.

5. Hallagi Z, Sadri MF, Dadvar F. Analysis of 58 cases of tinea capitis in Tehran, Razi Hospital. Acta Medical Iranica Journal. 2001;39(2):109-12.

6. Dinkela A, fene J, Mbata M, Schmid-Grendelmeier M, Hatz C. Efficacy of triclosan soap against superficial dermatomycoses. Int Dermatol J. 2007;46(2):23-28.

7. Mirmirani P, Willey A, Chamlin S, Price VH. Tinea capitis mimicking cicatricial alopecia: what host and dermatophyte factors lead to this unusual clinical presentation? Am J Dermatopathol. 2009;60(3):490-95.

8. Magia II, Guindo M, Diawara-Konare H, Keita S. Epidemiology of tinea capitis in school circle in Bamako. Mycologie Medicale J. 2001;11(3):143-48.

9. Ayaya SO, Kamar KK, Kakai R. Etiology of tinea capitis in school Children. East Afr Med J. 2001; 78(10):531-5.

10. Feuilhade M, Lacroix C. Epidemiology of tinea capitis. Presse Med. 2001;30(10):499-504.

11. Malaii H. Study of dermatophtosis infections frequency in various part of body and ethiologic factors. Journal of Sabzevar University of Medical Sciences 1999;7(1):85-92. (In Persian)

12. Zarehii Mahmoodabady A. Study of 382 suspicious patients of tinea capitis in Ahvaz. Journal of Ahvaz University of Medical Sciences. 1987;22:45-52. (In Persian)

13. Magill SS, Manfredi L, Swidersli A, Cohen B, Merz WG. Isolation of *Trichophyton violaceum* and *Trichophyton soudanense* in Baltimore, Maryland. J Clin Microbiol 2007;45(2):461-65.

14. Panackal AA, Halpern E, Watson AJ. Cutaneous fungal infections in the United States, 1995-2004. Int J Dermatol 2009;48(7):704-12.

15. Fathi HI, Al-Samarai AG. Prevalence of tinea capitis among schoolchildren in Iraq. East Mediter Health J. 2000;6(1):128-37.

16. Metintas S, Kiraz N, Arslantas D, Akqun Y, Unsal A. Frequency and risk factors of dermatophytosis in students living in rural areas in Eskisehir, Turkey. Mycopathologia. 2004;157(4):379-81.

17. Menan E, Zongo-Bonou O, Rouet F, Kiki-Barro P, Yavo W, Nevabi N, et al. Tinea capitis in schoolchildren from Ivory coast (Western Africa), A 1998-1999 cross-sectional study. Int J Dermatol. 2002;41(4):204-7.

18. Loo DS. Cutaneous fungal infections in the elderly. Dermatol Clin. 2004;22(1):33-50.

19. Satimia F, NcBride SR, Leppard B. Prevalence of skin disease in rural Tanzania and factors influencing the choice of health care, modern or traditional. J Dermatol. 1998;134(14):1363-66.

20. Goldsten AO, Smith KM, Ives TJ, Goldsten B. Mycotic infection, Effective management of conditions

involving the skin, hair, and nails. Geriatrics J. 2000; 55(5):45-52.

21. Wisuthsarewong W, Viravan S. Analysis of skin diseases in a referral pediatric dermatology clinic in Thailand. J Med Assoc Thai. 2000;83(9):999-1004.

22. Figueroa JI, Hawranek Th, Abraha A, Roderick J. Tinea capitis in south– western, Ethiopia: a study of risk factors for infection and carriage. J Dermatol. 1997; 36(9):661-66.

23. Khaksar A, Bassiri-jahromi S, Amirkhani A, Pour abdollahi A. Study the rate of prevalent of fungal disease tinea capitis in cities of Mazandaran province in 1994-1996. Teb and Tazkieh Journal 1998;31:52-56. (In Persian)

24. Aghamirian M, Keshavrz D, Jahani Hashemi H. Study of dermatophytosis in patients in Sina hospital in Gazvin. Iranian South Medical Journal 2006;9:175-81.

25. Alizadeh N, Sadre Ashkoori SH, Maboodi A, Fallahi E. Descriptive of types of tinea in Gilan. Journal of Dermatology Diseases. 2004;7(4):255-60.

26. Haghighi M, Matlabi M. Study of dermatophytosis prevalence in Gonabad primary school. Journal of Gonabad University of Medical Sciences 2000;7(1):10-16. (In Persian)

27. Berg D, Erickson P. Fungal skin infections in children: new developments and treatments. Postgrad Med J. 2001;110(1):83-94.

28. Ayanbimpe GM, Taghir H, Diya A, Wapwera S. Tinea capitis among primary school children in parts of central Nigeria. Mycoses J. 2008;51(4):336-40.

29. Dolenc-voljc M, Lunder M. Epidemic of mirosporum canis infection in the region of Ljubljana. J Dermatol. 1998;7(3-4):107-12.