Clinical Profile of Scabies in Children in the Outpatient Installation of Dr. Moewardi General Hospital Surakarta, the Period of January 2015- December 2019

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Abstract

Background: Scabies is caused by parasite, called *Sarcoptes scabiei,* infestation into the skin. Scabies is generally found in children who live in crowded environments and poor hygiene.

Methods: This is a retrospective descriptive study with secondary data collection from medical record data in the Outpatient Installation of RSDM for the period January 2015-December 2019. The subjects were infants to children aged 14 years with a diagnosis of scabies. Data variables used included age, gender, family history of scabies, diagnosis, comorbidities, supporting examinations and, therapy in scabies patients.

Results: There were 88 pediatric patients with scabies. The most age group that experienced child scabies was 11-14 years (33%) with the most sex being male (55%). The largest source of scabies transmission was from the family (39%). The most common lesion morphology was papules and excoriations (49%). The lesion location was found mostly between the fingers (24%). Examination of skin scrapings using NaCl 0.9% was positive only in 5 patients (6%) with the most diagnosis was scabies (77%)

Conclusion: This study shows that most of pediatric patients with scabies in the 11-14 years range are dominated by males. The most common sources of infection were families with papule morphology and excoriation, whereas the most lesions were found between the fingers. Skin scrapings are only positive 6% of cases. The most commonly used topical therapies are 5% permethrin and 2% ointment mupirocin while the systemic therapies are cetirizine and cefadroxil.

Key words: *Scabies, Sarcoptes scabiei, permethrine, cetirizine, cefadroxil*

Introduction

Scabies is caused by parasite infestation (*Sarcoptes scabiei)* into the skin. Scabies is generally found in children who live in crowded environments and poor hygiene.[1] The prevalence of scabies is affecting 200 million population worldwide, 5-10% of children and 10.4% of adults with the same proportion in both sexes.[2] Pruksachatkunakorn et al reported that scabies is mostly found in 1-7 years old childrens (87.3%).[2] The prevalence of scabies in Indonesia based on data from the Ministry of Health of the Republic of Indonesia (Depkes RI) in 2008 was 5.6-12.95% and is the third most reported skin disease. Paramita et al reported that the prevalence of scabies was 282 cases with the highest age being 5-14 years old (63.8%).[4]

Cardinal sign of scabies can manifest as nocturnal pruritus. On physical examination, excoriations were seen in the interdigital area, wrist, volar, axilla, areola mammae, scrotum, penis, gluteus and in areas with

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thin skin. The diagnosis is confirmed by finding pathognomonic signs in the form of tunnels in the skin and identification of *Sarcoptes scabiei* mites, eggs or scibales on microscopic examination.[1]

Scabies is also called a great imitator disease. Some of differential diagnosis of scabies include atopic dermatitis, dyshidrotic dermatitis, pyoderma, and prurigo.[1] In atopic dermatitis, the appearance of polymorphic lesions found on face and extensor (infants and children) and flexor areas in adults. Scabies accompanied by atopic dermatitis will give symptoms of itching and skin lesions like papules, pustules or vesicles. Severe pruritus causes patient to scratch the skin excessively, causing erosion and excoriation that facilitating secondary infections like pyoderma.[5,6] In dyshidrotic dermatitis, clinical features are found in the form of papules and vesicles which are mainly found on the lateral fingers.[7] Another complication that can occur in children is crustous impetigo with a clinical picture of multiple vesicles which then break down into crusts (mainly found in the face and extremities).[8]

Some of the therapeutic modalities that can be used in scabies are pyrethroid scabicide drug, namely 5% permethrin cream, 1% gamma hexachlorocyclohexane lotion, 10% crotamiton cream, 5-10% precipitum sulfiur, 10% benzyl benzoate lotion and oral ivermectin. These scabiei drugs are neurotoxic to Sarcoptes scabiei neurons, causing late repolarization, paralysis and death of adult *Sarcoptes scabiei.*[1,9]

Materials and Methods

This research is a retrospective descriptive study with secondary data collection from medical record data in the Outpatient Installation of RSDM in January 2015 until December 2019. The subjects were all infants to children aged 14 years with a diagnosis of scabies. Data variables used were age, gender, family history of scabies, diagnosis, comorbidities, supporting examinations and therapy. The inclusion criteria were children aged 0-14 years, no other skin disorders and no other systemic diseases. The exclusion criteria were patients over 14 years of age, having skin diseases other than scabies and atopic dermatitis.

Study area and population

Results and Discussion

In this research, there were 88 pediatric patients with scabies. The age group that experienced child scabies the most was 11-14 years as many as 29 patients (33%) and most of them is male with 48 patients (55%). The largest source of scabies transmission was from the family in 34 patients (39%), with the most common lesion morphology was papules and excoriations in 43 patients (49%), the lesions location were mostly between the fingers in 21 patients (24%). Skin scrapings using NaCl 0.9% was positive only in 5 patients (6%) with the most common diagnosis being scabies in 68 patients (77%) (Table 1).

Table 1. Data on child scabies dermographism in the outpatient installation of Dr. Moewardi General Hospital for the period January 2015-December 2019

Characteristics	Number of cases (n=88)	Percentage (%)
Age (year)		
< 1	7	8
1-4	28	32
5-10	24	27
11-14	29	33
Gender		
Male	48	55
Female	40	45
History of Transmission		
Family	34	39
Schoolmate	17	19
Islamic Boarding School	7	8
Neighbors	4	5
Unknown	27	31
Morphology of the lesion		
Papules and excoriation	43	49
Papules dan macula	19	22
Papules dan pustule	18	20
Papules dan erosion	8	9
Location of the lesion		
Head	10	11
Body	16	19
Extremity :		
Between the fingers	21	24
Between the toes	15	17
Genital	13	15
Gluteus	13	15
Scabies examination		
NaCl 0,9%	76	86
Burrow ink test	47	41
Positive examination result		
NaCl 0,9%	5	6
Burrow ink test	3	3
Diagnose		
Scabies without secondary infection	68	77
Scabies and secondary infection		
Pyoderma	6	7
Impetigo	3	3
Scabies and comorbidities		
HIV	5	6
Leukemia	3	3
Hashimoto thyroiditis	2	2
Down Syndrome	1	1
Epilepsy	1	1

HIV : Human immunodeficiency virus

Topical therapy using permethrin 5% was administered to all scabies patients, the most used topical antibiotic was mupirocin ointment 2% in 16 patients (18%). Systemic therapy was administered using antihistamine cetirizine in 51 patients (58%) and cefadroxil in 4 patients (5%) **(Table 2)**.

Table 2. Management of child scabies in the outpatient installation of Dr. Moewardi General Hospital for the period January 2015-December 2019

Therapy	Amount (n=88)	Persentase (%)
Topical Therapy		
Scabicide		
Permetrin 5%	88	100
Topical Antibiotic		
Without therapy	69	78
Mupirocin	16	18
Fusidic acid	1	1
Clindamycin	1	1
Gentamiycin	1	1
Systemic therapy		
Antibiotik oral		
Without therapy	80	90
Cefadroxil	4	5
Erythromycin	2	2
Cefixime	1	1
Azithromycin	1	1
Oral antihistamines		
Cetirizine	85	97
Desloratadine	1	1
CTM	1	1
Bepotastin besilate	1	1

Description: CTM: Chlorpeniramine maleate

There were 67 patients who did not return for control (76%). The duration of therapy in most cases was 8-14 days in 11 patients (13%), with improvement in clinical symptoms such as itching and skin lesions in 21 patients (24%), and recurrence was found in 3 patients (3%) **(Table 3).**

Table 3. Evaluation of pediatric scabies therapy in the outpatient installation of Dr. Moewardi General Hospital Surakarta for the period January 2015-December 2019

Evaluation of therapy	Number of cases (n=88)	Percentage (%)
Back to control		
Yes	21	24
1-7 days	8	9
8-14 days	11	13
>14 days	2	2
No	67	76
duration of therapy (days)		
1-7	0	0
8-14	86	97
> 15	2	2
improvement in clinical symptoms		
Itchy	21	24
Skin rash	21	24
Unknown	67	76
Recurrence		
Yes	3	3
No	18	20
Unknown	67	76

Discussion

Scabies is a parasitic infestation caused by Sarcoptes scabiei on the skin which often affects children. Scabies is problem in developing countries due to poor hygiene, low socioeconomic conditions and, crowded environment.[10] Dagne et al reported that scabies commonly affects children aged 11- 14 years of 46%, males more often than females.[11] The higher prevalence of 10-14 years old children suffering from scabies is due to the more frequent close contact of children in that age range and most of them do not know how to maintain proper personal hygiene, especially in boys.[4,12]

Several factors related to scabies transmission include close contact with the sufferer, especially among household members. Paramita et al. reported that the most common source of scabies transmission was through family members (51%).[4] This study is in accordance with Paramita et al with the most common source of scabies transmission between family members was 39%. Family members have sufficient time together which allows the scabies transmission through direct or indirect contact, such as using clothes, sheets, towels and family tools together.

The morphology of scabies lesions are papules, pustules, erosions and excoriations. The distribution of scabies lesions mostly on interdigital area of manus and pedis, volar, wrist, lateral palmar, elbow, axilla, scrotum, penis, glutea and also in the areola mammae and labia in women. Paramita et al reported that most scabies morphology lesions are papules and pustules (35%) and was most commonly found between fingers (37%).[4] This study reported different results with Paramita et al. that the most common morphology lesions are papules and excoriation by 49% and 24% between the fingers.

Simple investigations to diagnose scabies include skin scrapings taken from unexcoriated papules. Skin scrapings are placed on a slide and then examined under a microscope in dim light. Abdel-latif et al. reported that skin scrapings were positive in 10% of cases. This study reported 6% positive skin scrapings and is in accordance with Abdel-latif et al. Positive results on skin scrapings have low accuracy and are influenced by the low number of mites found due to errors during specimen collection and improper collection time (daytime).[13]

The diagnosis of scabies can be made based on the discovery of 2 out of 4 cardinal symptoms, including nocturnal pruritus, infection attacking humans in groups, found cuniculus, mites, and egg.[14] Paramita et al reported that the diagnosis of scabies was found in 73% of cases.[4] This study reported the results consistent with Paramita et al. which the diagnosis of scabies without secondary infection was found in 77% of cases.

Permethrin cream 5% is the first line recommendation for scabies therapy because high effectiveness with low toxicity risk.[15] Anderson et al. reported that 69% of scabies patients received 5% permethrin therapy. This study is in accordance with Anderson et al., that all pediatric scabies patients (100%) were treated with 5% permethrin cream. Permethrin is a synthetic pyrethroid which works by damaging the cell membrane of mites, disrupting the balance of the sodium channels which results in depolarization and paralysis of the respiratory tract in *Sarcoptes scabiei*.[16]

Scabies is often accompanied by secondary infestations for example pyoderma which is most commonly caused by gram-positive coccus bacteria.[1] Mupirocin is a broad-spectrum topical antibiotic that's recommended especially for gram-positive bacterial. Vasani et al. reported that the topical antibiotic used in secondary infestation of scabies was mupirocin by 30%.[17] This study is in accordance with Vasani et al. that the topical antibiotic used in secondary infestation of scabies was mupirocin by 18%. The action mechanism of mupirocin is to interfere with the synthesis of isoleucyl-tRNA synthetase, thereby inhibiting bacterial protein synthesis. Mupirocin has been shown to have excellent activity against Statpylococcus and most Streptococci but less effective against gram-negative bacterial infestations. Mupirocin has good skin penetration, can be absorbed through the circulation and metabolized into an inactive derivative, namely monic acid, and there is rarely a side effect of irritation on the skin.[18]

Systemic therapy for secondary infestations of scabies that can be considered is the first generation cephalosporins (cefadroxil), macrolides (azithromycin) and clindamycin.[19] This study is inconsistent with Mark et al. which's reported that the most common systemic antibiotic used in cases of secondary infestation of scabies was cefadroxil by 5%. Cefadroxil is a broad-spectrum beta-lactam ring antibiotic used in both gram-positive and gram-negative bacteria. The beta-lactam ring binds to protein binding protein (PBP) to play a role in inhibiting the activity of cell wall synthesis. Cephalosporins are also thought to play a role in autolysis activation of bacterial cells which causes bacterial cells to become lysis.[20]

Cetirizine is a second generation non-sedative antihistamine which is effective in reducing itching.[21] Paramita et al. reported that the most used antihistamine in scabies was mephidrolin napadisylate at 64%. This study the antihistamine given was cetirizine (97%) which is not in accordance with Paramita et al. Cetirizine is a fast-onset antihistamine and selective antagonist against histamine 1 (H1) receptors on smooth muscle cells, vascular endothelial cells, and gastrointestinal tract. Cetirizine does not cross the blood brain barrier and provides less sedation than first generation sedative antihistamines.[21] Cetirizine reduces pruritus by inhibits histamine production, neutrophil and eosinophil migration.[22] Cetirizine is rapidly absorbed through the gastrointestinal tract and excreted through kidneys.[23]

Scabies patients are advised to return for control within 7-14 days after receiving the first treatment. Paramita et al. reported that 61% did not return for control.[4] This study's results were consistent with Paramita et al. That 67% of patients did not return for control. It is probably because the patient feels that the disease already recovered or the existenace of secondary infections causing patient to go to other medical personnel.[4]

Scabies therapy using 5% permethrin can be repeated 7 days after receiving the first therapy with an average length of treatment for 14 days.[24] Sungkar et al. reported that scabies therapy using 5% permethrin was administered for 21 days in 69 patients (74 %).[25] This study reported results inconsistent with Sungkar et al. which scabies therapy using 5% permethrin was administered for 14 days in 86 patients (97%). Evaluation for 14 days is necessary because the larvae will become adult stage *Sarcoptes scabiei* within 10-14 days. Permethrin 5% cannot kill *Sarcoptes scabiei* eggs so that repeated therapy after 7 days is needed to kill *Sarcoptes scabiei* eggs that have hatched into adult mites.

Improvement of clinical symptoms in the form of reduced itching, skin rash and, the absence of new papules in scabies patients are indicators of successful therapy.[6] Musthaq et al. reported that pruritus and skin rash decreased during the 14-day evaluation were found in 45% of cases.[26] This study reported the results according to Mushtaq et al., that pruritus and skin rashes were reduced in 21 (24%) cases. The correct application of scaibicide, for example 5% permethrin, is very important in the success of therapy.

Scabies recurs if the individual still shows clinical manifestations after 6 weeks of initial therapy.[2] Sungkar et al. reported that scabies recurrence was 15.9% of cases.[27] This study is not in accordance with Sungkar et al who reported that scabies recurrence was found in 3% of cases. Symptoms that persist for more than 6 weeks should be re-evaluated because the possibility of treatment failure leading to recurrence in cases of scabies.[2]

Conclusion

In conclusion, there were 88 pediatric scabies patients in January 2014-December 2019. The age group experiencing child scabies the most is 11-14 years (33%), more males than females. The most common source of scabies transmission is the family (39%), with the morphology of papules and excoriations (49%), the lesions location was found mostly between fingers (24%). Only 6% positive skin scrapings were diagnosed with scabies in 77% of patients. Topical therapy using permethrin 5% was given to all scabies patients, the

most used topical antibiotic was mupirocin ointment 2% (18%). Systemic therapy was given in the form of antihistamines cetiricine (58%) and cefadroxil (5%).

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