

## MANAGEMENT OF SCABIES IN NURSING HOMES

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### Abstract

**Background:** Scabies is an infestation that occurs worldwide. The outbreak of scabies is often seen in institutionalized care such as the nursing homes which mainly cares for the elderly. This review article looks at the burden of scabies on the nursing care homes and community at large although very few studies have been done in this regard in Nigeria. It also focuses on the management which includes both the pharmacological and non-pharmacological aspects. The review also offers ways of prevention of scabies in these institutions. The method used was to search the internet using sites such as Google scholar, PubMed as well as looking through online journals and hard copies of text books. Scabies is of public health importance that presents a challenge with management in nursing homes.

**Keywords:** Elderly, Management, Nursing home, Scabies

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### INTRODUCTION

The word scabies comes from the Latin word- scabiei<sup>1</sup> which means rough, and the word scabere which means itch, scratch, scrape.<sup>2</sup> It has been considered as a neglected tropical disease. It is also seen as a sexually transmitted disease due to its transmission via direct skin to skin contact; however, it is controversial to say it can be a pointer to elderly abuse either as sexual abuse or as neglect due to the possible transmission via fomites.

### DEFINITIONS

Scabies is a contagious infestation caused by the itch mite called *sarcoptes scabiei hominis var hominis*. It can also occur in animals such cattle and sheep.<sup>2,3</sup> According to Oxford languages dictionary, a nursing home is a small private institution providing residential accommodation with healthcare, especially for elderly people. An outbreak of scabies is defined as two or more cases of scabies in resident or staff in a single care home.<sup>3,4</sup>

### EPIDEMIOLOGY

Scabies occurs worldwide; however, it is seen commonly amongst those with poor socioeconomic status and those in

extremes of age such as the elderly and children. Scabies can affect any one. It can affect persons of all ages, races and social status. Amongst those who are immunosuppressed, Norwegian scabies is known to be more frequent. Other risk factors include nosocomial transmission, overcrowding, poverty and sexual promiscuity.<sup>3</sup>

It is noted that about 300 million cases occur worldwide annually.<sup>3</sup> Estimated prevalence in the recent scabies-related literature range from 0.2% to 71%. Scabies is endemic in many resource-poor tropical settings, with an estimated average prevalence of 5 – 10% in children. Recurrent infestations are common.<sup>5</sup> Scabies consisted of 2.4% of new cases seen with a five -year period in a tertiary centre in Eastern Nigeria. There was a notable increase of cases over the five - year period with the number being almost 17 times more than the first year compared to the 5th year under study.<sup>6</sup> In a study carried out in a Northern state amongst rural dwellers , scabies was diagnosed in 65% of the participants.<sup>7</sup> In a rural primary school in the North, the incidence of scabies was 2.9% amongst the skin problems found on the children.<sup>8</sup> In a Port Harcourt correctional

centre, epidemiological factors were assessed amongst inmates to ascertain their awareness of scabies and possible risk factors.<sup>9</sup> The nursing homes and elderly care centres are very few and currently it is estimated to be about 25 of such facilities in Nigeria as at 2019.<sup>10</sup> Very few studies exist on the prevalence of scabies in their centres; however being a residential institution nursing homes or elderly care places are equally at risk of scabies break out. Dementia has been associated as a risk factor for scabies.<sup>4</sup>

**TYPES**

1) Classical type which is usually seen in those with a strong immunity, 2) The atypical, crusted or Norwegian scabies is seen in those with immunosuppression or in the elderly who have reduced immunity due to the effects of aging on immune cells.<sup>3,11,12</sup> 3) Nodular scabies is another type that is characterized by nodules that are about 2-20 mm in diameter and seen mostly in young children that cannot scratch.<sup>3</sup> The difference between these types is in the response of immune system to the presence of the mites. The younger age-groups tend to have the classical type where there are fewer mites, itching and the presence of burrows. In the elderly, particularly those institutionalized as seen in nursing homes have the crusted scabies where the mites are in thousands, the itching- scratch reflex might be suppressed and the typical clinical features like burrows are not seen.<sup>3,11,12</sup>

**CLINICAL FEATURES**

Scabies is characterized by both primary and secondary lesions. It is characterized by superficial linear burrows, inflamed papules and nodules which are intensely itchy and can be secondarily infected by bacteria.<sup>3,11,12</sup> Secondary

lesions that can occur are crusted papules, eczematous plaques, excoriations, post inflammatory hyperpigmentation, erythroderma, prurigo nodules and frank pyoderma.<sup>3</sup> Common signs of crusted scabies is that it is widespread, thick, easily crumbles with grayish colour.<sup>11</sup> The scalp lesions and nail dystrophy is common in the crusted.

**PATHOPHYSIOLOGY**

The transmission of the scabies mite is either through direct contact with the skin or indirect via fomites such as beddings and clothes. The parasite *sarcoptes scabiei* can contaminate clothes from the environment and can remain alive after 48-72 hours. The incubation period is about 4-6 weeks before the itching occurs. Re-infection with the mature adults is followed by hypersensitivity after 24 hours. The female mite is the culprit while the male dies soon after mating. A person who is asymptomatic can also spread the mites or eggs. There may be prolonged interval of up to two months before any contagious signs.<sup>3,13,14</sup>

**DIAGNOSIS**

Consensus criteria have been developed to make the diagnosis of scabies more precise. The criteria is based on three levels- confirmed, clinical and suspected; with the first two levels having three categories and the third having two categories. Confirmed scabies is the visualization of the mite, eggs or fecal matter by acceptable magnifying devices; clinical scabies is typical signs and symptoms of scabies infestation; and suspected scabies is defined as an atypical clinical presentation of scabies.<sup>15</sup>

**Table 1: Summary of 2018 IACS criteria for the diagnosis of scabies<sup>15</sup>**

A -Confirmed Cases- At least one of these	B- Clinical Case- At least one of these	C- Suspected Case- Any one of these	History – features in support of diagnoses
Mites, eggs or feces on light microscopy of skin samples	Scabies burrows	Typical lesions in a typical distribution and one history feature	Itch
Mites, eggs or feces visualized on individual using high-powered imaging device	Typical lesions affecting male genitalia	Atypical lesions or atypical distribution and two history features	Close contact with an individual who has itch or typical lesions in a typical distribution
Mite visualized on individual using dermoscopy	Typical lesions in a typical distribution and two history features	-	-
Notes – 1- Diagnosis can be made at any of the three levels 2- A diagnosis of clinical and suspected scabies should be only made if the other differential diagnosis is unlikely.			

nursing homes, can result in hundreds of patients and staff becoming infected.<sup>12,13-16</sup>

## MANAGEMENT

Characteristic features that make management of scabies in nursing homes difficult are protracted and delayed diagnosis due to atypical presentation in the elderly; asymptomatic infestation in staff and high transmissibility of mites to staff relations at home.<sup>10</sup> The management would involve taking a detailed history, physical examination, investigations, treatment and prevention.

### History

This would help in contact tracing; involving all who have a close contact with the patient. The typical history of pruritus is common in the classical type and is known to be severe. Pruritus may not be a feature amongst those who are nursed in homes, and they are more likely to have the crusted scabies due to several factors such as immunosuppression due chronic illnesses including diabetes, tuberculosis and HIV/AIDS; chronic malnutrition, poor mental health including depression and dementia. Outbreak in health care institutions, such as

### Physical Examination

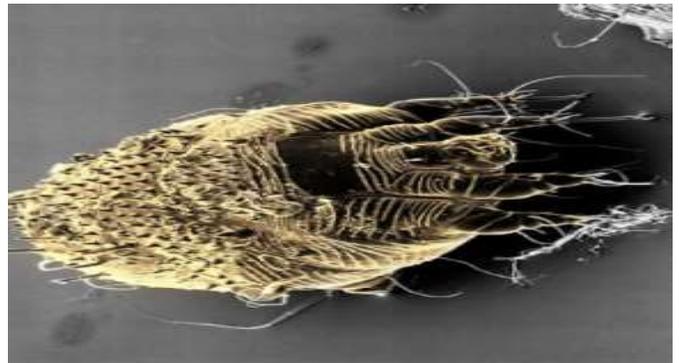
The sites of predilection for mite's bites and burrows include the inter digital web spaces, sides of the fingers, volar aspect of the wrists, lateral palms, elbows, axillae, scrotum, penis, labia and areola.<sup>3,11-18</sup> In the chronically ill, elderly and infants the scalp, face and ears are also affected. The site of the rash or itch may not always coincide with the with the mite's site. The primary lesions in scabies include burrows which are the pathognomonic features produced by the tunneling of the mite in the stratum corneum.<sup>13-14</sup> The other lesions include nodules and papules. In the immunosuppressed there could be exaggerated scabies, papular, bullous and crusted scabies. Secondary lesions can also be seen such as excoriations, widespread eczematous dermatitis, honey coloured crustings, post inflammatory hyperpigmentation, prurigo nodules, pyoderma and erythroderma.<sup>3,14,17-18</sup>

**A**



Light microscopic view of *Sarcoptes scabiei*  
Courtesy Pioneer/Tiffany Jones

**B**



Electron Microscopic view  
Courtesy Ofondu, E 2013

**C**



Scabies on the elbow  
Courtesy Amadi, E 2021

**D**



Crusted scabies (Google.com, 2018)

**E****Inter digital scabies, (Wikipedia, 2018)****F****Crusted Scabies (Medscape,2021)****INVESTIGATIONS**

Scabies is usually diagnosed clinically. The relevance of investigations is to confirm the diagnosis. The Ink test can be used to outline the site of the burrow and a wet mark pen is used and can be easily wiped with alcohol.<sup>3,12,19</sup> Alternatively for larger areas, topical tetracycline solution which is colourless can be used, similar method as with ink test is carried out but the area is examined under Wood's light and its fluorescence is green. Skin scrapping with oil emersion and examination under the microscope aids the identification of the live mite, its eggs or fecal matter, scybala. KOH is used only in crusted scabies where it helps to digest the excessive keratin. Superficial cyanoacrylate biopsy (SCAB) with conventional transillumination light microscopy can be used to visualize the anatomy of the mite.<sup>3,13-14</sup>

The dermoscopic features include triangle or delta jet sign which represents the dense heads of the mite, mini-triangle signs that represent the translucent ovoid eggs and an S shaped burrow. The delta wing jet and trailing sign corresponds to the head of the mite and trailing burrow respectively.<sup>20</sup> Other tests that can be done are the adhesive skin test which can be combined with dermoscopy, biopsy and histology of burrow sites, and polymerase chain reaction (PCR).<sup>3,13-14,18</sup> The 3I (Identify-Isolate-Inform) tool can assist frontline workers in the identification and management of potential cases of scabies presenting to the accident and emergency department.<sup>19</sup>

**TREATMENT**

The importance of properly treating scabies in the nursing home is that scabies is contagious and can spread to other community members.<sup>16</sup> It can also be a source of

irritation, depression and anemia in those that are hospitalized who are already faced with other comorbidities. It could also be a cause of friction and frustration amongst the residential staff.<sup>10</sup> The presentation of scabies in those in the nursing homes may be of the different types and methods of treatment are similar. A contact is any person who has had skin to skin contact with affected persons and would include family members, friends, health workers, and residential staff.<sup>21</sup> The management of those in the residential facilities would depend on the category if it is an isolated case of the classical type, epidemic cases of classical type, increasing recurrence of same cases, an epidemic involving cases of Norwegian scabies. The general management would include having a warm bath (this is not supported by some authors, applying medication on the body; this could be 5% permethrin or malathion or 25% benzyl benzoate. The instructions on application should be followed. Clothes, bed linen, curtains should be washed and ironed. The laundry men should wear gloves and gowns when washing. Hot cycles of the washing machine should be used to kill the mites. The persons coming in contact with them should wear protective clothing and there should be barrier nursing. Fomites such as furniture difficult to wash should be left in a cool and well-ventilated place for the mites to die.<sup>10, 21-24</sup>

For those with Norwegian scabies which is characterized by heavy infestation of millions of mites and reduced intensity of itching would require stricter measures to be carried out. A combination of three or more measures would be carried out including the use of oral ivermectin which has also been shown to be effective and safe across different age groups.<sup>25,26</sup> Ivermectin was once thought to

be unsafe in the elderly, leading to increased deaths has not proven to be so over the past two decades since it was reported.<sup>27,28</sup> The side effects of these drugs should be put into consideration because hypersensitivity to these drugs might be mistaken for re-infestation or hypersensitivity to the mite fragments or fecal matter.<sup>3,14</sup> Adjuvants such as soothing lotions, antihistamines, analgesics and anxiolytics can be beneficial according to individual cases.<sup>3,13-14</sup>

Pharmacokinetics in the older adult is how the older body acts on the drug. Absorption in the intestine generally remains unchanged for most drugs despite slow emptying

time and increased gastric pH. Increased body fat with aging causes in distribution of lipophilic drugs.<sup>29</sup> Hepatic metabolism decreases with age and this was one of the concerns with ivermectin.<sup>27</sup> Renal elimination of drugs also decreases. Pharmacodynamics is the drug's effect on the body which depends on the receptor of the drugs and chemical interactions.<sup>30</sup> Apart from anti-histamines; most drugs used for the management of scabies in the elderly are relatively safe. First generation H1 anti-histamines such as chlorpheniramine, are associated with central nervous system adverse effects such as agitation, dizziness, drowsiness, fatigue, hallucinations, impaired thinking and memory loss.

**Table 2: Drug treatment for Scabies**<sup>3,10-14,31-40</sup>

Drug	Mechanism of action	Route /Dose	Side effects	Other medical uses in the older adult
<b>Allethrin e.g. Esdepallthrine</b>	It is a synthetic pyrethroid that inhibits the nervous system of mites and several other organisms.	Aerosol spray, Not yet approved for scabies	Eye irritant. Nasal irritation Contact irritant dermatitis	Insecticide
<b>10% Benzyl benzoate</b>	It has toxic effects on the nervous system of the parasite, resulting in its death. It is also toxic to mite ova, though its exact mechanism of action is unknown	Topical/ Apply for 24 hours on the skin and wash off Can be done for 3 consecutive days.	Acute contact dermatitis, scaling of skin, difficulty in urinating (dribbling) jerking movements sudden loss of consciousness	Head and body lice
<b>10% Cromatiton</b>	It is toxic to the scabies mite. Has a counter-irritation effect. As it evaporates from the skin, it produces a cooling effect.	Topical, applied within 2 consecutive days, then repeated once in 5 days	Irritation of the skin	Sun burn, skin pruritus
<b>Ivermectin</b>	Ivermectin causes an influx of Cl <sup>-</sup> ions through the cell membrane of invertebrates by activation of specific ivermectin-sensitive ion channels. The resultant hyperpolarization leads to muscle paralysis.	Single oral dose of 200ug, can be repeated in 10-14 days  0.8% ointment of Ivermectin is available and is showing promising results.	Myalgia, malaise, lightheadedness, and occasionally postural hypotension. In onchocerciasis, skin oedema, pruritis and mild eye irritation may be seen.	Onchocerciasis, strongyloides, other round worm infection, pubic lice Evaluated for COVID 19
<b>1% Lindane (gammabenzene-hexachloride)</b>	It exerts its parasiticidal action by being directly absorbed through the parasite's exoskeleton (primarily lice, or scabies) and their ova. The gamma-aminobutyric acid	Topical, applied for 8 hours then washed off, applied after a week	Contact irritant dermatitis, neurotoxicity especially after a bath or in crusted scabies which has extended lesions	lice

	(GABA(1)) receptor/chloride ionophore complex is the primary site of action for lindane,	Not recommended in children less than 10years Not recommended in crusted scabies		
<b>0.5% Malathion In aqueous base</b>	It exerts its action on the nervous system of the mite by irreversibly inhibiting the activity of cholinesterase, thereby allowing acetylcholine to accumulate at cholinergic synapses and enhancing cholinergic receptor stimulation	Topical, left for 24 hours and washed	Contact irritant dermatitis Chemical burns	Lice
<b>Precipitated sulphur 2-10% ointment. 25% Monosulfiram lotion</b>	Sulfur acts as a keratolytic agent and also it has antibacterial activity. It also kills fungi, scabies mites and other parasites when is converted to hydrogen sulphide.	It is topical Applied for 3 days then washed off	Xerosis, contact irritant dermatitis	acne vulgaris, acne rosacea, and seborrhoeic dermatitis, lice
<b>5% Permethrin</b>	It acts on the nerve cell membrane to disrupt the sodium channel current that regulates the polarization of the membrane. This results in delayed repolarization and subsequent paralysis and death of the parasites. It exhibits residual ovicidal activity after rinsing.	Topical, Left for 8-14 hours, then repeated a week later	Contact irritant dermatitis, erythema Category B Pregnancy drug	Lice

## PREVENTION

### The Impact of Contacts on Community Health

Due to the extended incubation period of scabies, there may also be asymptomatic carriers who can re-infest others after treatment has been done. It is important to assess the skin a fortnight after treatment. Poor treatment and poor contact tracing of potential carriers can lead to spread in the community. This can also lead to a re-infestation of cured cases within the nursing homes in the community.<sup>10,21-23</sup>

### Modes of Prevention

There are several guidelines, collaborations and studies that are available for prevention and control of scabies infestation. The four levels of prevention can also be applied to scabies.<sup>41</sup>

**Primordial prevention** – This would aim to reduce the risk factor of scabies which in this case is the preventing the stay of patients in nursing homes. Individuals are encouraged to live healthy lives both physically and mentally from childhood and continue to do so unto adult life. Mass drug administration has helped to reduce the prevalence in some communities in Fiji.<sup>4,10,23</sup>

**Primary prevention** – This would involve prior actions taking to halt the existence of scabies in the nursing homes maintaining the expected bed distance and room occupancy of nursing homes and ensuring personal grooming of each resident. Health promotion and specific prevention are measures that can be instituted such as the use of pesticides to kill off mites in the environment. Check for adequate nutrition, hygiene and other factors that may predispose to scabies. Institute hygiene measures

like hand washing, use of soap, universal measures for staff.<sup>3, 23</sup>

**Secondary prevention** – This would include regular examination of all nursing residents and surveillance for those infested. Isolation of cases that are infested and barrier nursing instituted. Contact tracing is instituted and treatment can be given to all including sexual contacts. Treatment is for two months. Condoms do not prevent them. Look out for suspected cases, collect data and calculate odds ratio and test for significance to get epidemiological basis. Inform the relevant health authorities like the local health council. After effectively treating patients with scabies, screen visitors and staff before entry into the home. Prolonged surveillance is needed for the elimination of institutional scabies.<sup>21,23</sup>

**Tertiary prevention** – This is prevention of any disability that may arise from the scourge of scabies. The staff and inmates may suffer low self-esteem if they are discovered they have scabies. Counseling, education and reassurance for all are required. Maintenance of adequate nutrition and rehabilitation of the inmates both physically and mentally is important.<sup>10,23</sup>

## CONCLUSION

Scabies is regarded as a neglected tropical disease. The components of effective treatment consist of isolation of affected cases, de-infestation, communication, surveillance, education of residential community and contact tracing of all persons.

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