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Infant Mortality from Scabies Complicated by Sepsis and Renal Failure–A Case Report in Twin Infants at a Government Hospital in Benin City, Edo State, Nigeria

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ABSTRACT: Scabies remains a common parasitic infestation associated with poor living conditions and overcrowding which is caused by the sarcoptes scabies mite; and mostly affects those in extremes of age. This paper therefore evaluates Infant Mortality from Scabies Complicated by Sepsis and Renal Failure in Twin Infants at a Government Hospital in Benin City, Edo State, Nigeria using appropriate clinical and standard methods such as papules which can be scaly, presence of burrows, intense nocturnal pruritus and irritability; and excoriations on the skin which can serve as a portal for infection. Although Scabies is considered to be benign; it can however be complicated in rare case with overwhelming bacterial infection leading to septicaemia and renal compromise especially in children; and this requires prompt diagnosis and treatment. We report a case of scabies complicated by overwhelming sepsis in twin infants arising from delay in seeking care and impeded diagnosis due to atypical presentation from possible associated abuse of super-potent steroids in Twin infants; eventually resulting in the mortality of one of the Twin. Availability of proper diagnostic measures and tools; along with appropriate treatment is essential for scabies cases to prevent attendant complications. Abuse of triple action creams should be discouraged and its availability restricted due to the far-reaching implications of its use and complications.

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The ectoparasite sarcoptes scabiei var hominis is known to cause human scabies. It is associated with intense nocturnal itching which is as a result of deposition of the mite's eggs, faecal matter and deposits on the epidermal layer of the skin (Ararsa *et al*., 2023). This disease is usually transmitted by prolonged skin-to-skin contact with an infected individual. Although this itchy dermatosis can affect individuals of all ages, it is most prevalent in children under 2 years of age. (Nweke, 2021) and (Ararsa *et al.*, 2023). Several factors increase the susceptibility of acquiring this dreaded infestation most notably overcrowding, poor personal hygiene, poverty, poor environmental sanitation, and immunosuppression. Outbreaks have been reported in refugee camps and institutions demonstrating the role of poor hygiene and overcrowding in potentiating the transmission of the infestation (Thompson *et al*., 2021). In infants and younger children, scabies can present as atypical lesions such as vesicles, pustules and nodules, which is in contrast to the presentation in adults and elderly which usually manifests as linear streaks of burrows or nodules. Norwegian scabies, the worse form of infectious scabies is found commonly in severely

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immunocompromised individuals (Thompson *et al.*, 2021). Despite the propitious nature of scabies, secondary complications may rarely arise which worsens the prognosis of the disease (Whittle, 1975).

The objective of this paper was to investigate the infant mortality from scabies complicated by sepsis and renal failure with a case report in twin infants at a government hospital in Benin City, Edo State, Nigeria.

MATERIALS AND METHODS

Case highlight: This report helps to highlight the diagnostic and management challenges encountered in the treatment of scabies especially in resource poor setting; and in cases where a trained dermatologist is lacking. This case also demonstrates the problems of indiscriminate use of over the counter superpotent steroids (triple action creams) with its attendant topical and systemic complications; which worsened the clinical outlook in this index case; resulting in a mortality in a dermatoses that is otherwise considered benign. Financial challenges, low level of education in the mother as well as poor living conditions and hygiene levels were also depicted as contributing factors in this case mortality.

Case report: We report a case of a 3-month old male infant (first of a set of twin) who presented to the children emergency room (CHER) with generalized skin lesions. Lesions were florid, scaly, crusted with papular rashes and patches on the skin, and associated hypopigmentation, atrophy and excoriations of the skin. He had crusty lesions on the scalp, palms and soles of feet as well. Lesions were discoloured with gentian violet ink, which mother applied on the lesions, mostly on the neck, feet, perineum and hands, where lesions were most severe.

Mother reported rash started as papular and nodular rashes first noticed 4 weeks prior to presentation. Rash has persisted and became severe over time as baby usually cries inconsolable during the evenings. There is history of similar rash in the elder sister as well as mother and father; and recently in his twin brother. The rashes on the twin brother were also papular rashes with discoloured scaly skin patches extending to the soles of the feet. At onset of rash, mother first visited a primary health care centre where she was given several oral and topical medications (names she cannot remember). As lesions persisted and worsened she decided to buy over the counter medications including triple action creams and several herbal topical and oral concortions, which she administered; first to twin-one; and later on to twin-two as his symptoms progressed. However, lesions worsened until 3 days prior to presentation, when the infant (first twin) developed fever, fast breathing, difficulty in breathing, pyuria, reduced urine volume, lethargy, abdominal distention and poor feeding; all of which persisted till presentation in children emergency room (CHER). The infant is the 7th child, while his twin brother is the 8th child in a monogamous setting, father is a truck driver, and mother is a businesswoman who sells small food items. They live in a two-bedroom apartment with poor ventilation. Mother delivered both twin via Caesarian delivery on account of footling breech in the first twin at term. Children were placed on formula feed after birth as mother was unable to commence breastfeeding after birth. Children had achieved all developmental milestones and received appropriate immunization for age.

On examination, he (twin one) was acutely ill looking, in obvious respiratory distress, with florid rough pin-point generalized papules and pustules involving the trunk, face, legs and arms (similar lesions were present in the second twin as well). There were excoriations of skin involving the neck, armpit, perineum, hands and feet with bullae demonstrating a positive Nikolsky sign. Scaly lesions, with pustules and hypopigmentation and atrophy of the skin were also present. Oxygen saturation was poor, random blood sugar was 138mg/dl. He had fever, anemia and leukopenia with relative granulocytosis.

An assessment of erythema multiforme? scalded skin syndrome r/o itchy dermatosis in a child with possible severe scabies was made.

He was subsequently commenced on supplemental oxygen, blood transfusion, and intravenous broad spectrum antibiotics: ceftriaxone, and metronidazole. He had oliguria, which later progressed to anuria as he did not make urine, despite urethral catheterization and renal challenge with intravenous fluids and frusemide. Topical mupirocin, 5% permethrin, crotamiton and antihistamine were also administered. Antibiotics and topical medications including 5% permethrin were also administered to his twin brother (twin two), which gave marked improvement of lesions as crying and irritability reduced. Mother was counseled about personal hygiene and need for treatment of clothings and fomites, as well as concomitant treatment of household contacts. Twin two was discharged home after 5 days and mother was instructed to bring the child for follow-up in one week; however twin one succumbed to the illness due to overwhelming *septicaemia* with renal compromise.

Fig 1: Lesions on the genital region.

Fig 2: showing the atrophic hypopigmented / depigmented skin with papules and pustular lesions on the face, chest and abdomen in Twin one. Lesions on the wrist, neck, and interdigital web spaces are coved with gentian violet ink.

Fig 3: showing extensive papules pustules and excoriations on the trunk in twin two.

RESULTS AND DISCUSSION

Sarcoptes scabei infestation cause by the parasite Sarcoptes scabiei var hominis remains a ravaging disease affecting all age-groups including young children and infants who are particularly vulnerable to the disease (Ararsa *et al.,* 2023) and (Romani *et al*., 2015). The global burden of scabies has continued to increase with enormous attention being focused on its public health importance and disease burden due to which WHO has adopted scabies as a neglected tropical disease (Report of the Tenth Meeting of the WHO Strategic and Technical Advisory Group for Neglected Tropical Diseases, 2017). The burden of Scabies infestation in communities now constitutes a serious public health challenge especially in at risk populations such as children and elderly (Ararsa *et al.,* 2023) and (Skayem *et al*., 2023). Recent studies in Nigeria and Ethiopia placed the burden of scabies among children at 10.0% and 19.26% respectively. (Nweke, 2021) and (Ararsa *et al.,* 2023). Ogunbiyi *et al.,* 2005) also reported an incidence of scabies in 4.7% of school children in Ibadan, Nigeria.

This infestation leads to inadvertent stimulation of severe itching commonly in affected persons and is spreads by close contacts with untoward risks being greatly increased in younger children from exposure to adults who are often care givers (Thompson *et al.,* 2021) Several other demographic factors similar to those identified in this case; serves to potentiate its transmission such as overcrowding, immunosuppression, poor personal hygiene and sharing of clothing and fomites (Thompson *et al.,* 2021).

Interestingly, its prevalence has also been on the rise from recent surveys carried out in Nigeria. This is relatable to poor living conditions, personal hygiene, impoverished conditions and even the sexual route being listed as a route of transmission (Barot *et al.,* 2018). Onyekonwu *et al.,* (2018) in South–eastern Nigeria reported a case incidence of 2.4%; however; the study noted a notable rise in case incidence over a 5 year period of 0.18% to 6.67%. A more recent study by Ugbomoiko *et al.,* (2018) reported a prevalence of 65% in Northern-Nigeria.

Scabies infestation is typically predominant in low income settings, poor living and hygiene conditions and overcrowded settings (Thompson *et. al*., 2021)). The twins were the last of 7 children in a monogamous setting, residing in a poorly ventilated and crowded two-bedroom apartment. Their parents were low income earners; Mother being a petty trader

and Father a truck driver. These are evident factors that potentiate the spread of the infestation.

The disease manifests with intense pruritus which is its commonest symptom. Ugbomioko *et al.,* (2018) and Skylar *et al.,* (2023) reported itching in 77.7% and 95% of cases respectively. The appearance of burrows and papular rash is often seen in scabies; which may be non-specific, commonly affecting warmer areas of the body and may also be generalized in children and infants (Thompson *et al.,* 2021); creating a diagnostic dilemma for doctors lacking experience. This index case presented with lesions that appeared generalized but were atypical, hence the diagnosis as missed at first visit by the Physician. These lesions may have been altered by prolonged use of superpotent steroids from the triple action creams being applied to patients' skin by their parents (Figure 2).

The itching seen in scabies is often worse at night and severe; creating a lot of discomfort and morbidity in those affected; thereby impairing their quality of life. A study reported a total of 64% of subjects complaining of sleep disturbances. (Ugbomoiko *et al*., 2018) This burden may to be worse in children and infants who may be unable to express the distress due to poorly developed scratch reflex in younger ages; causing them to become highly irritable (Johnston *et al*., 2005), Camacaro *et al*., 2015) and this distress can easily be extended to the caregivers. Similarly, the index case was noticed at the start of presentation to attempt to scratch different areas of the body; while crying uncontrollably and exhibiting signs of distress especially at night and during hot weather as reported their mother who is their primary care giver. Leung *et al*., 2019) described similar presentation of distress which is mostly noted to be nocturnal in sufferers of scabies.

Lesions noticed in the children were described as papular (figure 3) and later progressed to become associated with blisters and pustular lesions which are suggestive of secondary bacterial infection that has been noted as a possible complication seen in scabies (Thompson *et al*., 2021). These pustules as were more evident in the first twin who manifested with symptoms as he had a longer exposure to use of superpotent steroid medications which caused a worsening of his clinical manifestations. These presentations of the disease are in keeping with the clinical patterns of scabies defined in previous literature where the lesions are widespread; even extending to the head and neck regions which is often spared in adult presentation (Thompson *et al*., 2021).

The point of contact of this dermatosis in children is often from a close family member. Several literatures corroborate this facts; Betlloch-Mas, (2024) reported similar features of scabies in close family members in 94% of cases studied. Lesion suggestive of scabies with intense pruritus was also noticed in the mother and older siblings of index cases.

In the following weeks, the first twin was noticed to have developed fever and malaise. Clinical evaluation showed possible sepsis of the patient. Labouratory investigations revealed evidence associated renal compromise. The Parents initially refused hospital care for the children and also initially withheld appropriate history of patients's symptoms. The twins were later brought back with twin 1 in more critical state with evident signs of secondary infection and renal failure; who later succumbed to the illness after a few days. Use and abuse of triple action creams has become quite common in our environment (Nnoruka *et al.,* 2006) and (Odey *et al*., 2020); possibly due to lack of knowledge of its side effects or financial challenges in accessing competent hospital care leading to patients seeking alternative means of treatment. Steroid exposure has been listed as possible risk of complicated scabies (Estrada-Chávez, 2018) and this contributed to the worsened clinical outcome seen in Twin 1.

At presentations, a diagnosis of erythema multiforme was made initially which was later reviewed to scabies after the review by a Dermatologist. A French study also reported initial misdiagnosis of scabies in about 41.1% of scabies cases. (Skayem, 2023) This further emphasizes the gaps in or health care delivery system; buttressing the need for competent dermatology services in our health care system which has recently been challenged with the burden of brain drain in the country (Ipinnimo, 2023). This has led to an increased number of missed cases which may undermine the actual burden of the disease while also leading to poorly managed cases as seen in this index case where the abuse of superpotent steroids actually potentiated the associated comorbidities in Twin 1; leading to the mortality reported in this case.

Although scabies infestation has a huge morbidity and burden; it is however considered as benign; occasionally becoming complicated with conditions such as pyoderma, acute glomerulonephritis, superimposed bacterial infection and in rare cases; septicaemia (Whittle, 1975). In this index case, septicaemia was seen in Twin one which ultimately led to his death. Incidence of mortality in scabies appears to be rare; studies by Hasan *et al* and Roberts

et al reported mortalities of 16% and 14% respectively; though these were recorded among subjects with severe crusted scabies. A study by Lynar *et al.,* (2017) showed that staphylococcus aureus superinfection had a 30 day- mortality of about 16.1%.

Diagnosis of scabies infestation can often be made clinically especially with the classical history and clinical features. However, in complicated cases with polymorphous lesions, this would require expert dermatology review and possible visualization of the mites using a dermoscope/ videodermoscopy and reflectance confocal microscope which demonstrates the Honey-combing sign of burrows in linear segments. Videodermoscopy is particularly useful in cases of treatment failures because it helps to identify the presence of the mites and its faecal matter and other body parts in post treatment cases still experiencing symptoms after treatment (Al-Dabbagh, 2023). Other non-invasive diagnostic modalities include Adhesive tape test for microscopic examination; Burrow ink test which is positive with demonstration of dark zig-zag lines after cleaning the stained skin with alcohol. (Al-Dabbagh, 2023) and (Engelman, 2020). Invasive modalities for diagnosing scabies includes Polymerase chain reaction (PCR), Serology using ELISA to demonstrate the presence of antibodies against the scabies antigen; this method is very sensitive but its disadvantage is that it is very time-consuming. The adult mites in the burrows may also be seen on histology of skin specimen (Al-Dabbagh, 2023 and Engelman, 2020). The treatment of this condition is based on use of anti-scabicidal agents such as 5% permethrin cream which is the first line for management. Permethrin use is also advantageous because of its high tolerability especially in infants; and even pregnant and lactating mothers who are often the reservoir of infestation affecting infants. In this index case, the treatment of the mother and other household contacts was imperative as the second twin who returned home faced the risk of re-infestation. 10-25% benzyl benzoate topical preparation and oral ivermectin at 150-200µg/kg weekly for two weeks are other common options. Benzyl benzoate tends to be unpopular because of the irritation and dermatitis that makes it intolerable for patients (Al-Dabbagh, 2023) and (Engelman 2020). Oral ivermectin is particularly useful in crusted scabies (Ortega-Loayza *et. al.,* 2013). Other treatment options include 0.5% malathione, sulfur ointment, crotamiton which helps relieve the itch; and lindane which is associated with neurotoxicity. Topical keratolytic agents such as topical urea and salicylic acid preparations helps with reducing hyperkeratotic lesions especially seen in crusted scabies (karthikeyan, 2009). Other treatment options are tailored to the associated complications encountered in the cases.

Conclusion: This case report evidently demonstrates the burden of unprofessional care in the diagnosis and management of Scabies; while also emphasizing the damage of use of superpotent steroids, delayed diagnosis (and possibly missed cases which undermines the actual prevalence of scabies in our environment); as well as financial challenges experienced in this case posing limitation to assessing proper medical treatment and care; ultimately resulting in the mortality in an otherwise benign disease. Efforts should be geared towards increasing awareness on the increasing prevalence of cases; while also training medical personnel on the required skills for early diagnosis of scabies and prompt treatments. Regulation of the availability and abuse of superpotent steroid preparations should be strictly enforced to avoid the complications and damages that associated with their use.

Conflict of Interest: The Authors declare no conflict of interest in writing up this manuscript.

Data availability statement: Data for this case report is available upon request from the first Author

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