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Dermascopy and Ink Test for Diagnosis of Scabies - Our Experience

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1. Introduction

Scabies is a disease caused by mites, *Sarcoptes scabiei* which is common across all age groups. This disease has also been included as part of global neglected diseases. There are approximately 450 million cases of scabies recorded [1]. Worldwide exhaustive and complete data regarding epidemiology of scabies is not available. A WHO review collected data from 18 prevalent studies between 1971-2001 and reported scabies prevalence ranging between 0.2%-24%. Particularly high prevalence figures reported from India.

In India, there is a tremendous disease burden at hospital level, which strongly supports the need for survey at community level. In most cases, investigations are useful in diagnosis through direct micro scoping of the scrapings to visualise the mite or mite products. Other methods include, Dermascopy, Confocal video-scopes, PCR test.

The 2020 International Alliance for the Control of Scabies (IACS) Consensus Criteria for the Diagnosis of Scabies include three levels of diagnostic certainty - Confirmed scabies (level A) requires direct visualisation of the mite or its products. Clinical scabies (level B) and suspected scabies (level C) rely on clinical assessment of signs and symptoms. Evidence-based, consensus methods for microscopy, visualisation and clinical symptoms and signs were developed, along with a media library [2].

Dermoscopy remains operator dependent, and cost involved may be a deterrent. Dermoscopy may not visualise faeces or eggs and harder to detect mites in darker skin. However, by adding ink-test to dermascopy, it will help facilitate better diagnosis. Ink-test is easy to perform and not expensive. The paper presents results noted in diagnosis of scabies using a combination of dermascopy and ink test.

In the case report that we are presenting, we have leveraged the use of Ink test and dermascopy was used for visualisation to aid in the diagnosis. This method is useful in atypical cases and infants as both the tests are non-invasive. Burrow ink test is very easy to perform and does not require the usage of lot of material to perform. Its efficacy is further increased by addition of dermascopy to visualise the burrows of the mite and the mite itself [3,4].

2. Objective

The objective was to establish the diagnosis of scabies by incorporating two known methods of diagnosis of scabies which are, BIT and dermascopy.

3. Methods

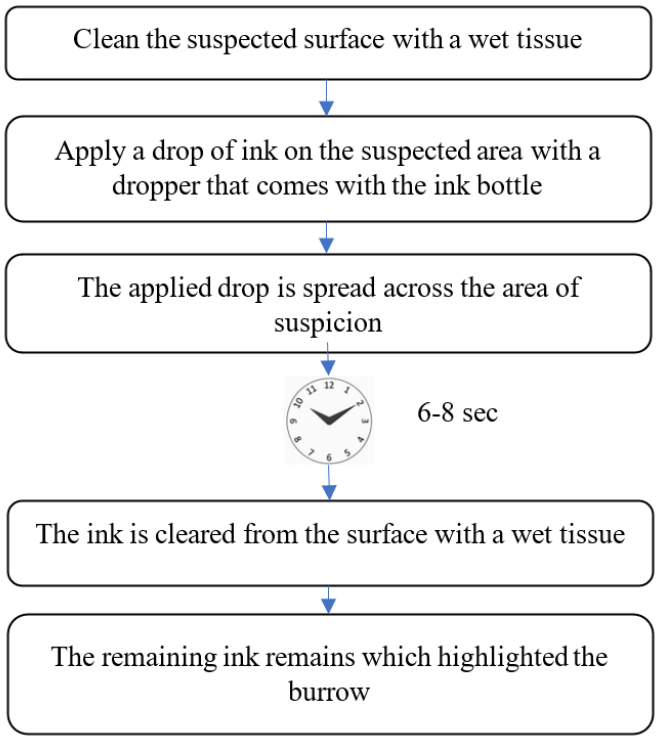
BIT followed by dermascopy was performed in the cases in OPD setting. Photographs taken before and after the test in suspected cases.

3.1 Procedure for performing the tests

- **Step 1: Ink-Test**

An ink test is performed by applying ink or a felt pen to the area of suspicion and cleaning it with a soft tissue within 6-8 sec of application. This would enable the ink on the surface to be cleaned out, with the help of hand sanitiser, alcohol, liquid soap, which may highlight the burrow present clearly with the ink, giving a clear indication of the burrow present.

Process flow of performing the ink-test



3.2 Cost of performing the ink test

- Fountain ink - INR 0.33/- (60 ml ink bottle - INR 20/-)
- Tissue paper - INR 1.50/-
- Earbud - INR 1.85/- (Note - Pen tip/ felt pen/ dropper can be used instead of an ear bud)

Total cost of performing one ink test - INR 3.68/- which is approximately $ 0.051.

4. Case Report

4.1 Case report- 1

The case involved, an 8-month-old boy, who presented with lesions over the body, underarms, hands and back of the head. The child was irritable in the night and when placed on the bed would rub his head to the bed during night time. There were also papules that could be evidenced on the left armpit of the baby and on the back of the head.

Ink test and BIT was performed on the palm of the baby by applying ink to the suspected area. For this case fountain pen ink was used. The area was cleaned with hand sanitiser and a clean tissue 6-8 sec post application. Upon cleaning a clear burrow highlighted in blue could be evidenced at the end of which there was the triangular head of the scabies mite.

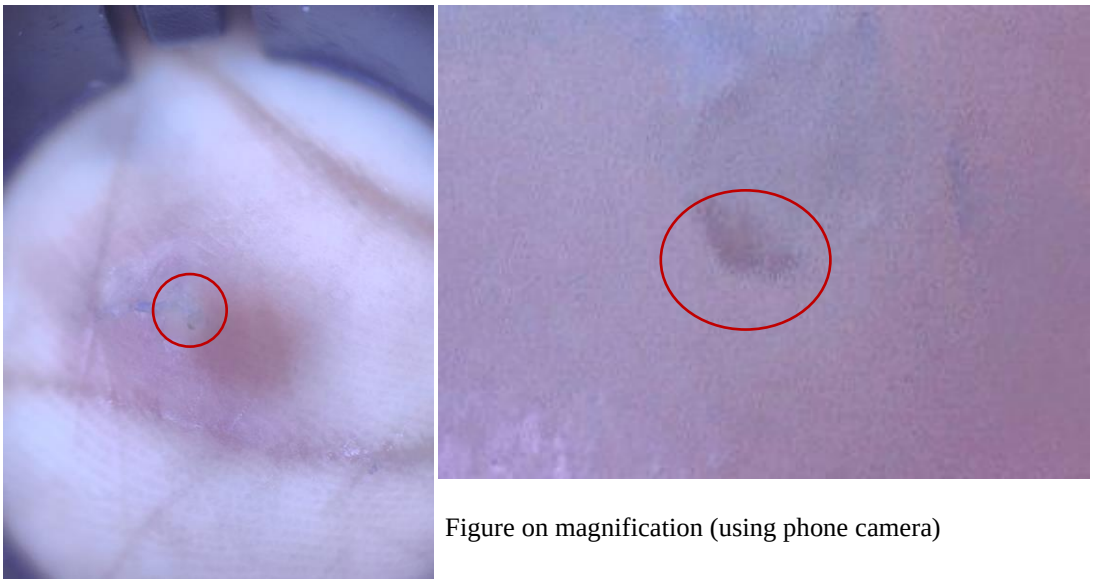
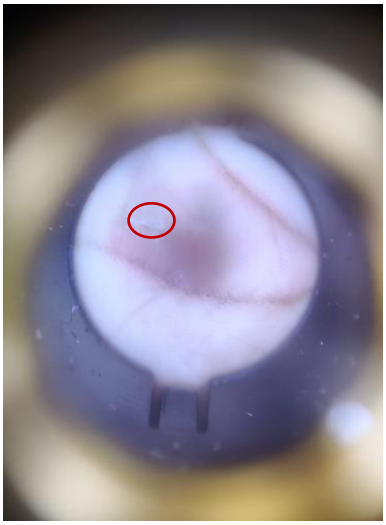


Figure on magnification (using phone camera)

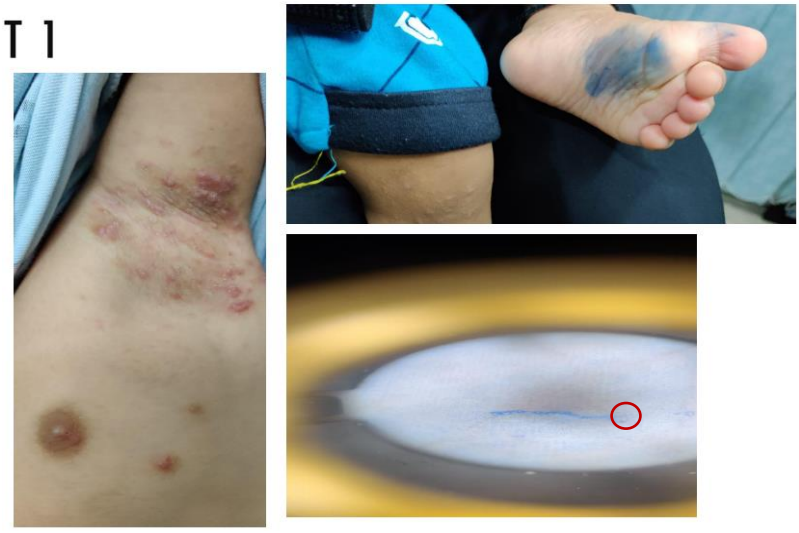


The image of the burrow was further enhanced using a dermascopy, Dermalite 100 was used. The figure shows the magnified image using a Dermascope.

The dermascope enabled us to examine the burrow beneath the skin surfaces without being obstructed by the surface reflections of the skin.

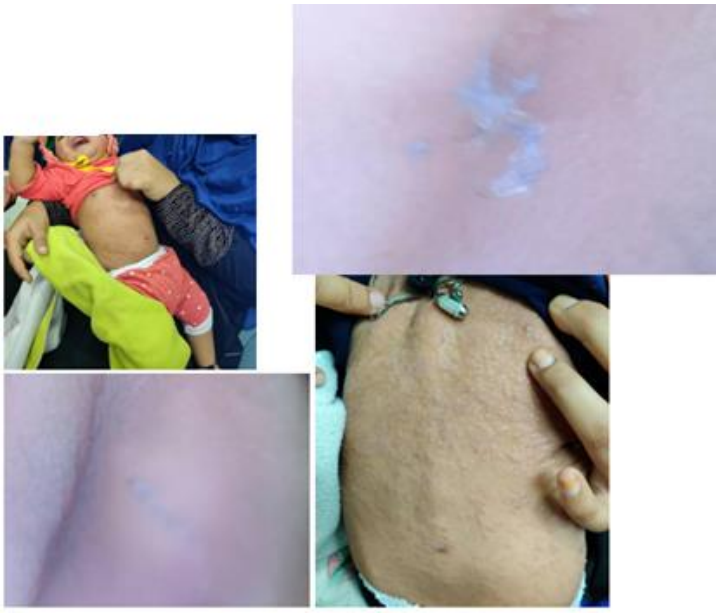
4.2 Case report- 2

The case involved a one-year-old child with lesions in both armpits. The left armpit had multiple different sized red papules and the right armpit had smaller sized papules, of which only few were erythematous. Careful examination of the sole of the foot showed a burrow, post which an ink test was conducted, followed by dermascopy, revealing classic ink filled burrow, which confirmed the diagnosis. The case was treated with 200 mcg/kg Ivermectin and topical application of 5% Permethrin cream. Follow up showed significant improvement.



4.3 Case report- 3

The case involved a four-month-old baby, presented with extensive involvement of erythematous populous lesions with eczematisation on the body, face, hands. The child was irritable, and scabies was suspected, post which an ink test was done followed by dermascopy, revealing brilliant looking burrows with ink and at the tip of the burrow, triangular head of the scabies was evidenced. Three burrows along with mites were observed which confirmed the diagnosis.



5. Treatment

Case was treated with Ivermectol - 200 mcg/Kg and application of Permithrin - 5% with complete resolution of lesion [5].

6. Conclusion

It was possible to do ink test and dermascopy in three suspected cases of scabies using dermascopy and BIT test to establish the diagnosis. In each of the infant cases they were appropriately treated with Ivermectol orally at 200 mcg per kg body weight and through local application of Permithrin 5%.

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