Simple Method of Detecting *Sarcoptes Scabiei Var Hominis* Mites among Bedridden Elderly Patients Suffering from Severe Scabies Infestation Using an Adhesive-Tape

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**Abstract**

**Object**  Scabies infestation is very common among bedridden elderly patients. The standard method of diagnosis for scabies by scraping the skin requires some skill. Therefore, dermatologists employ this method. However, dermatologists are usually not present in most long-term nursing units. Thus, we tried to catch mites using a strong transparent adhesive tape commercially available for packing use as an alternative method for the diagnosis of severe scabies infestation.

**Methods**  After firmly applying the adhesive side of the tape onto an appropriate skin lesion of patients, the tape was pulled off and transferred directly onto a slide for microscopy, affixing the adhered separated part of the corneal skin.

**Patients**  When a massive outbreak of scabies infestation occurred in May 2004 at the nursing unit of K hospital with thirty-one bedridden elderly patients, we tried to detect scabies mite using an adhesive tape.

**Results**  We could detect mites from six patients using this tape method. The diagnosis was confirmed by the standard scraping method. By the tape method we could observe some mites moving around and also could see a striated structure with dark red or weak red color or gray color granule-like constitution on the body of some mites. We found mites only on the skin of the fingers and toes where the skin of a patient is thin. Recently, massive scabies infestation in elderly long-term residents has been reported elsewhere. This tape method is simple and useful for diagnosis of severe scabies infestation in long-term nursing units.

**Key words:** adhesive tape method, alternative diagnosis, scabies infestation, bedridden elderly patients

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**Introduction**

Scabies (*sarcoptes scabiei var hominis*) is common worldwide, especially among elderly long-term residents (1-3). Because the number of elderly is increasing year by year in Japan, control of infestation by scabies is now very important. Once the diagnosis of scabies has been confirmed, treatment with drug therapy is associated with a favorable clinical outcome (3). But the diagnosis of scabies is not always easy even though a standard method has been established, which involves scraping off the appropriate lesions by scalpel, adding potassium hydroxide solution onto the scraped skin on the slide, and then examining for mites by microscope (4). Although tape stripping is reported not to be useful (5), we tried using strong adhesive tape to detect mites as an alternative diagnostic method for the elderly bedridden patients suffering from severe scabies infestation.

**Patients and Methods**

Thirty-one bedridden patients with a mean age of 82.4±9.4 years at the nursing unit of K hospital were used for this study when a large outbreak of scabies infection occurred in May 2004.

We used a commercially available transparent tape for packing (640PFD-50, Nichiban Co., Tokyo) with one adhesive side, and applied it to catch mites by pressing the adhesive side onto an appropriate skin lesion. After several seconds we pulled the tape off, resulting in many small sepa-
Table 1. Acral Areas Such as Hands, Finger Webs, Feet, Penis are Reported to be the Best Sites to Find Mites (8). We Tried to Detect Mites Using the Tape Method or the Standard Method Applied to Fingers, Dorsal Surfaces of Hands or Toes of Patients. By the Tape Method We Found Six Patients with Mites Among Thirty-one Patients. Mites Were Located on the Surface of Fingers of Four Patients, and the Surface of Toes of Two Patients. By the Standard Method We Found Mites on the Surface of Fingers of All of the Above Six Patients. Mites Were Located at the Dorsal Surface of Hands of Three Patients. Mites Were Also Located at the Surface of Toes of Two Patients. The Mite Detection Percentage Using the Tape Method Was Apparently Lower Than by the Standard Method.

<table>
<thead>
<tr>
<th>Location of mites among six patients</th>
<th>Method</th>
<th>Finger</th>
<th>Dorsal surface of hand</th>
<th>Toe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape method</td>
<td>4/6</td>
<td>0/6</td>
<td>2/6</td>
<td></td>
</tr>
<tr>
<td>Standard method</td>
<td>6/6</td>
<td>3/6</td>
<td>2/6</td>
<td></td>
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</tbody>
</table>

rated parts of corneal skin attaching to the adhesive side. Then, we transferred the adhesive side of the tape directly onto a glass slide. In order to catch mites effectively, the side of the tape should be cut large enough to be approximately the same size as the microscope slide. We applied the tape method to the appropriate akin lesions of all thirty-one patients.

The standard scraping method for detecting mites was only used for patients who had first been diagnosed as scabies by the tape method.

Results

We found mites by this tape method in six among thirty-one bedridden patients. We applied the standard scraping method to the above six patients and also found mites in all of them (Table 1). By the tape method we could find some mites easily because these mites moved around in the space between the surface of the slide and tape. We could also observe the striated structure of some mite bodies by the dark red (Fig. 1) or weak red (Fig. 2) color on the body. The circumference of every mite was black in color (Figs. 1, 2). We could observe that a fine gray granule-like constitution on some part of the body was always moving in the live mites (Figs. 1, 2). However, we observed a striated structure of dark black color on the body of other mites. One of the above six patients was thought to suffer from Norwegian scabies because the skin of her fingers was crusted, a feature characteristic of Norwegian scabies (2). By using the standard method for a patient suffering from Norwegian scabies, we found mite eggs and many mites, just as in our previous report (2). However, with the adhesive tape method, we could not find any eggs despite detecting many mites. After obtaining the informed consent of the patients or their families, all 31 patients including the six mentioned above were treated with γ BHC, in order to protect patients in other nursing units from the massive scabies infestation. Many patients aside from the six cases mentioned above complained of itchiness on some part of their skin showing some feature of sarcoptes skin lesion (3). After γ BHC therapy, scabies infestation at that nursing unit completely subsided.

Discussion

The standard method for detecting scabies mites is usually employed by a dermatologist because the scraping technique requires some skill. However, dermatologists are generally not present at most elderly long-term institutions where infestation often occurs. Therefore, a more simple and easy method for detecting mites is anticipated.

Although a tape stripping method was reported to be not useful for isolated patients (5), our method using a strong
adhesive tape seems useful for detecting mites in bedridden elderly patients. Probably, the thin and dry skin of elderly patients (6) makes it possible to detect mites in this way. It should be noted that we could find mites only on the skin of fingers and toes where the skin is thin. Therefore, such areas are recommended as mite detecting sites. Although the manufacturer urges caution not to use this adhesive packing tape on human skin, we found it could be used safely by applying it only a few seconds to the patient’s skin.

Using the present tape method, we could observe the striated structure with a dark or weak red color and fine gray granule-like constitution on the body of some moving mites, although such structure with red or gray color was not observed by incident light microscope (5), epiluminescence microscope (7) or by the standard method (8). The use of 10% potassium hydrochloride onto the scraped skin on the slide by the standard method (2) may have erased the red or gray color.

We doubt that we can apply this tape stripping method to some certain isolated patients because we could not find mites on some patients. Probably, the mites are located deep in the thick and wet skin of such patients. Ivermectin is widely used around the world (9) including Japan as the agent of choice for scabies. Since our elderly patients suffer from many diseases and are treated with many agents daily, we paid serious attention to the drug interaction with other agents. We decided to use γ BHC applied to the skin externally. Although the usual dosage of γ BHC was reported to be a 1% solution (3), we used a 0.2% BHC solution for all thirty-one patients in this study, because many of our patients were lean and suffered from various chronic diseases. Although the mite detection percentage was apparently low compared to the standard method, this method is so simple and easy that any doctor can perform it for elderly patients in a large outbreak of scabies infestation.

References


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