"HAIR PENETRATION TEST" IN RELATION TO HAIRS WITH VARIOUS STRUCTURAL ABNORMALITIES AND HIRSUTISM HAIRS

By

B. S. VERMA

The comparitive ability of various dermatophytes and non-dermatophytes to penetrate human hair 'in vitro', considering the age and sex factors has been studied by Verma (1966). Later, the author has also studied hair penetration tests in relation to hair of different human races (Verma 1966).

The present study is in furtherance of these two previous studies and was undertaken to find out the susceptibility of human hair showing structural abnormalities to fungal attack and also the susceptibility of human hirsutism hairs due to hormona influences, to fungal attack.

EXPERIMENT I

The susceptibility to fungal attack in vitro of human hair showing various structural abnormalities.

Five hairs from a case of pili annulati and leucotrichia annularis were tested against five normal hairs as control.

The diseased and normal hairs of 1 cm. length were placed in two separate MacCartney's bottles, which were then autoclaved for 15 minutes at 125°C. To each of these bottles 10 ml. of sterile water, 2 drops of yeast extract and the culture of T. mentagrophytes were then added. The hair were examined daily, for fungus perforation by using a drop of lectophenol blue stain.

CONCLUSION

All the hairs were found to be penetrated on the 3rd day. Hair affected with pili torti and leucotrichia annularis do not show earlier or later penetration by dermatophyte fungi when compared with normal hair.

EXPERIMEMT 2

Susceptibiliiy of human hirsutism hairs (resulting from corticosteroid therapy) to fungal attack in vitro.

Hairs were collected from three patients who had developed hirsutism as a result of prolonged corticosteroid therapy. These were inoculated separately as in previous experiments with T. mentagrophyte and were examined daily for evidence of fungal invasion. In parallel with these tests, and under similar conditions of experiment, hairs from three adult subjects not receiving corticosteroids were inoculated and regularly examined.

CONCLUSION

No evidence was obtained which suggested that hirsutism hairs resulting from corticosteroid therapy were more or less susceptible to fungal attack than were hairs from normal subjects.

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* Head of Skin and V. D. Deparment, Medical College, Baroda.

Received for publication on 21-2-1966.

DISCUSSION

Penetration tests were carried out on hairs from a patient having pili torti and leucotrichia annularis (pili annulati). Pili torti is a rare condition in which hair is twisted throughout its entire length, usually at regular intervals. Such twists reflect light giving a shimmering appearance. Patients suffering from this condition are usually born bald and any hair growth which develops later usually remains short. The child may remain bald until one to two years of age, and the scalp often shows hyperkeratosis; eyebrows and eyelashes may rarely be affected. Microscopically, slight twisting of the hair bulb is found with some degree of atrophy of adjoining sebaceous glands and follicles.

Hellier et al (1940) have studied the molecular structure of the twisted hair in this condition. In leucotrichia annularis (pili annulati), the hair shafts shows spindle shaped white zones of about 1/75 inch in length, alternating with pigmented areas of 1/50 inch in length. In reflected light, ring-like zones are seen as a result of this deviation of pigmentation. The entire scalp or merely a few hairs may be involved, and the complete hair shaft or only part of it may be affected. These zones devoid of pigment may result from intermittent periods of malnutrition of the hair follicles. Although the pigment is present, it is rendered invisible by the presence of gas bubbles between the cells of the outer cortical layers. It has been suggested that this gas is carbon dioxide since it was found to be completely dissolved by a solution of sodium hydroxide which had been fully saturated with air. In the present studies hairs affected with pili torti and leucotrichia annularis did not show earlier or later penetration by dermatophyte fungi in vitro when compared with normal hairs.

The abnormal hair-growth which occurs in human as a result of prolonged corticosteroid therapy was no more or less susceptible to fungal attack in vitro than were normal hairs. This was the one opportunity which presented itself during these studies to investigate the possible effect of sex hormones on scalp hair in relation to susceptibility to fungus infection. No differences in susceptibility to fungus attack were, in fact, observed in male and female hair.

SUMMARY

Hair penetration test was done on hairs affected with pili torti and leucotrichia annularis, and also on hirsutism hairs produced by prolonged corticosteroid therapy. Normal hairs were used as control.

The hairs used in these experiments did not show either more or less susceptibility to fungal attack ' in vitro ' in comparision to normal hair.

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