

OCCUPATIONAL ALOPECIA IN VARIOUS WORKERS AFTER EXPOSURE TO CHEMICAL AGENTS.

C. Frati, B. Bevilacqua, M.G. Battisti and G. Pizzutelli

ABSTRACT

It is pointed out that the importance of professional alopecia may sometimes be underestimated. Different types of professional alopecia depending on the causal agent are distinguished: physical, chemical, biological, and pharmacological. In 48 out of 51 patients we found no professional aetiology. On the contrary, in 3 out of 51 patients we were able to detect an exogenous professional agent causing alopecia. The agents involved in our 3 cases of professional alopecia were: boric acid salts, thallium salts, and colchicine. In all 3 patients there was no evidence of inflammatory lesions, telangiectasia or scars. The complete resolution of the disease after removing the specific causal agent confirmed an exogenous aetiology. Treatment with cystine seems to have been beneficial.

KEY WORDS

occupational alopecia, boric acid, thallium salts, colchicine, cystine

INTRODUCTION

Alopecia indicates a pathological absence of hair in a restricted area, but this term is used also to illustrate a mild and widespread reduction of hair (1). We would like to point

out that the importance of professional alopecia is sometimes underestimated.

Professional alopecia can be grouped, depending on the

causal agent, into: physical (trauma, burns, radiations); chemical (thallium, boric acid, chloroprene); biological (tuberculosis, tinea); and pharmacological (antimetabolites, anticoagulants) (2).

Traumatic alopecia is due to a physical trauma on the scalp. Several authors described traumatic alopecia caused by caps or strings worn over long periods at work (3).

Burns may be responsible for cicatricial alopecia, especially in: radiologists, surgeons, orthopaedists, dentists, and radiology technicians due to exposition over long periods to small doses of radiation without sufficient protection. These radiations can damage the germinative layer of epidermis and cause a dilatation of blood vessels in dermis with release of histamine that provokes erythema (4).

Several chemical agents may be involved in professional alopecia (5). Thallium is one of the most important. It is used in glass and optical (lens) industries, fireworks manufacturing, preparation of phosphorescent paints, insecticides, and the like. Alopecia develops after 3 to 4 months in patches but it may suddenly become widespread if large quantities of thallium are ingested (6). Boric acid is utilized in several industries: glass, nuclear, textile and pharmaceuticals. It is also used as a bleaching agent. Persons exposed to this chemical may gradually develop widespread alopecia (7).

Chloroprene is a colourless liquid used in the manufacture of tyres, carry ribbons, waterproof products, as well as of brake linings, welding machine tubes, etc. Chloroprene may provoke a gradually developing widespread reversible alopecia (7). Biological agents may occasionally cause a professional alopecia in medical personnel, e.g. doctors, nurses, technicians who are exposed to infections like tuberculosis or tinea (8).

Antimetabolites like colchicine may produce a widespread pharmacological alopecia. Colchicine is an antimitotic drug contained in lily bulbs, so professional exposure is possible, especially in florists (9).

Anticoagulants, like coumarin, contained in rat pesticides, can develop a widespread alopecia 2 months after exposure (9).

The aim of this report is to discuss "professional alopecia" among patients with hair loss.

MATERIALS AND METHODS

In our service we observed 51 subjects from 11 to 72-year-old, of whom 27 were women affected by alopecia (androgenetic alopecia and kerion celsi were previously

excluded). All patients were submitted to a questionnaire with the aim of detecting endogenous and exogenous causal agents.

Laboratory tests and clinical examinations to evidence the anagen/telogen ratio were performed.

RESULTS

In 48 subjects we found no professional aetiology. In these patients several agents were implicated to determine alopecia: in 12 stress, in 10 drugs, in 5 endocrine diseases, in 5 seborrhea of the scalp, in 4 autoimmune diseases, in 2 iron deficiency, in 2 sudden loss of weight, in 2 trichotillomania, in 2 cosmetics, in 1 insect bite, in 1 anorexia, in 1 domestic burn, and in 1 tinea.

In 3 out of 51 patients we were able to find an exogenous professional agent which provoked alopecia.

CASE 1

A 40-year-old man, in good condition, with normal alimentary habits, not a drug user, was a worker in pharmaceutical industry during five years. A container of boric acid salts broke accidentally so that the worker's vertex of the scalp became exposed to a large quantity of this substance. The patient developed an acute intoxication with headache and myalgia resolving in a few days. After a short period he noticed a widespread alopecia and consulted our service. The clinical examination revealed a gradually spreading alopecia of the vertex area and an anagen hair type of alopecia. The patient was removed from his job and in a few months a complete regrowth of his hair took place.

CASE 2

A 34-year-old man, a farmer, arrived to our observation 1 month after the occurrence of alopecia. The anamnestic data disclosed the use of pesticides containing several substances capable of developing alopecia. An interesting finding was the elevated concentration of thallium salts in 24-hour urine (0.9 mg). Alopecia was evident on the scalp and the arms.

CASE 3

A 35-year-old man, in good condition, with normal alimentary habits, not a drug user, was a worker in a flower garden. His duty was to pick, pack and water flowers. While working in shorts he fell accidentally on a large amount of lily bulbs so that his limbs came into contact with them. After about one month he developed an acute and widespread alopecia of the limbs. It is relevant to note that lily bulbs contain large quantities of colchicine, an antimitotic agent capable of causing alopecia.

DISCUSSION

The authors' observations support the data of other authors who noticed that alopecia is a disease implicating numerous other factors in addition to the constitutional predisposition and heredity.

In 3 out of 51 patients an exogenous agent was evidently the reason of hair loss. Laboratory tests and anamnestic examination revealed no other factor that might have been responsible for alopecia. All 3 patients had an anagen type of

alopecia, and there was no evidence of inflammatory lesions, teleanectasia or scars. A complete resolution of the symptoms following the patients' removal from contact with causative agents confirmed the involvement of an exogenous substance. It is interesting to note that case 3 had been previously affected by gout and treated with colchicine which fact contributed to the development of alopecia.

In all 3 patients, when kept away from the substance involved and treated with cystine, the symptoms disappeared as described previously (12-13).

REFERENCES

1. Rook A, Wilkinson DS, Ebling FJG: Textbook of Dermatology. Oxford, Blackwell Scientific Publications, 1982.
2. Lanwerys R: Manuale di tossicologia industriale e delle intossicazioni professionali Milano, Casa Edritice Ambrosiana, 1980.
3. Rook A, Dawber R: Malattie dei capelli e del cuoio capelluto. Roma, Capozzi Editore, 1982, 491.
4. Coggle JE: Biological effects of radiation. Salluzzo Editore, 1985
5. Casarett CJ, Doull J: Toxicology. The basic science of poisons. New York, Ed. Mac Millan, 1975.
6. Zitko V: Toxicity and pollution potential of thallium. Sci. Tot. Environ. 1985, 4, 185.
7. Adams RM: Occupational Skin Disease. New York, Grune and Stratton, 1983, 7.
8. Saurat JH, Laugier P, Grosshans, Lachapelle JM: Manuale di Dermatologia e Venereologia. Milano, Masson, 1992.
9. Bronner AK, Hood Af: Cutaneous complications of chemiotherapeutic agents. J Am Acad Dermatol 1983, 9, 645.
10. Fitzpatrick TB, Eisen AZ, Freedberg IM, Austen KF: Dermatology in General Medicine. New York, Mc Graw Hill, 1987, 218.
11. Sartorelli E: Trattato di Medicina del Lavoro. Padova, Piccin, 1981.
12. Frati C, Simoni S, Ribuffo M: Indicazioni terapeutiche della Cistina per compresse in dermatologia ed in medicina generale. Chron Derm 1982, 1.
13. Frati C, Fileccia P, Cavalieri R, Guarnieri D: Aggiornamento sull'uso terapeutico della Cistina per via generale e la sua tollerabilità: esperienza decennale in un ospedale dermatologico. Chron Derm 1986, 6, 869.

AUTHORS' ADDRESSES

Corrado Frati M.D. professor and chairman, Department of dermatology Frosinone Hospital
Viale Mazzini 03100 Frosinone. Italy
Leonardo Bevilacqua M.D. Department of occupational medicine, University "La Sapienza" Rome
Piazzale Aldo Moro 00100 Rome. Italy
Maria Gabriella Battisti M.D. same address.