While female patients showed a numerical predominance (66%), in keeping with previous observations of the general population of dermatology patients (2, 4, 5), there was no real difference between the sexes in this elderly group when totals were adjusted according to female: male population ratio in the respective age groups of the general population.

Droller (6) found allergic contact dermatitis to be rare in the elderly, however, an incidence of 3.5% in the present group compares favourably with the finding of Weismann et al. (3), that this condition is as frequent among the elderly as in the normal populations in Scandinavian countries. In the present group, 9 cases of a primary diagnosis of allergic contact dermatitis accounted for 32 positive epicutaneous test reactions involving 23 different allergens.

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Transformation of Myelodysplasia to Acute Myeloid Leukaemia during Psoralen Photochemotherapy (PUVA) Treatment of Psoriasis

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A patient with stable chronic myelomonocytic leukaemia was treated with 8-methoxypsoralen photochemotherapy (PUVA) for erythrodermic psoriasis. After 4 months, transformation to acute myeloid leukaemia (AML) occurred. We would suggest caution when considering PUVA therapy in patients with pre-leukaemic disorders. ***Key word: Chronic myelomonocytic leukaemia.***

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The myelodysplastic syndromes (MDS) are a group of related disorders which have in common a high incidence of evolution to acute leukaemia. It is widely believed that the MDS represent a stage in malignant transformation of haemopoietic stem cells brought about by cumulative genetic insults. The nature of these insults is unknown, but viruses, chemicals and radiation have been suggested as possible factors (1).

Psoralen plus long-wave ultraviolet photochemotherapy (PUVA) produces DNA damage in human cells in vitro (2) and its potential for inducing malignant change is undisputed. Since a substantial proportion of long-wave ultraviolet light (UVA) directed at the skin penetrates the dermis (3) it seems likely that PUVA could inflict DNA damage on haemopoietic stem cells circulating through the dermal vasculature (4). This could ultimately result in malignant transformation.

Here, we describe a patient with Chronic myelomonocytic leukaemia (CMML) in whom transformation to acute myeloid leukaemia (AML) occurred during PUVA therapy for psoriasis.

CASE REPORT

A 71-year-old caucasian man presented in 1983 with spontaneous bruising. There were no other symptoms. He had a long history of chronic plaque psoriasis and polymyalgia rheumatica diagnosed 7 years previously, for which he was receiving prednisolone 5 mg daily. Psoriatic plaques were present on the legs but clinical examination was otherwise entirely normal. Haemoglobin was 12.3 g/dl, platelets 79×10^9/l, and white cell count 16.8×10^9/l, of which 57% were mature neutrophils, 12% lymphocytes, 9% monocytes, 6% myelocytes, 5% myeloblasts and 4% nucleated red cells.

Bone marrow trephine showed hypercellularity with active normoblastic erythropoiesis, and increased granulopoiesis, with large numbers of hypogranular polymorphonuclear leukocytes. Megakaryocytes were increased in number and dysplastic forms and occasional micromegakaryocytes were present. Cytogenetic studies revealed no abnormalities. The peripheral blood and bone marrow appearances were of CMML. No treatment was instituted and the patient remained well with a stable peripheral blood picture for 3 years.

In April 1986, the patient developed anorexia and weight loss over a period of 4 weeks associated with rectal bleeding and epistaxis. On examination he was pale, with moderate hepatosplenomegaly. Haemoglobin was 9.1 g/dl, platelets 16×10^9/l, and white cell count 213×10^9, of which 45% were mature neutrophils, 1% lymphocytes, 12% monocytes, 12% metamyelocytes and 29% myelocytes. Bone marrow trephine revealed hypercellularity composed of myeloid and monocytoid cells. Megakaryocytes were virtually absent and reticulin was increased.

Hydroxyurea treatment was started 1.5 g daily and within several weeks the patient improved, as did the peripheral blood picture. The hydroxyurea was tapered and subsequently discontinued in November 1986. Over the next 18 months the patient's clinical state and blood picture remained relatively stable and only occasional erythrocyte transfusions were required.

In November 1987, the patient was referred to the Dermatology department with erythrodermic psoriasis which had developed over several weeks. On examination there was exfoliative erythroderma involving the entire skin surface. There was no lymphadenopathy, but moderate hepatic and splenic enlargement were present, as before. Blood counts showed changes of CMML. He was admitted to hospital and treated with bed rest and emollients. The erythroderma failed to improve and so in December 1987 PUVA therapy was commenced with oral 8-methoxypsoralen 0.6 mg/kg and long-wave ultraviolet light (UVA). Treatment was given three times a week. After seven treatments the erythroderma worsened. The PUVA was stopped temporarily and the skin improved with emollients and an increase in oral prednisolone to 20 mg daily. Prednisolone was tapered to 10 mg daily and after 4 weeks the PUVA was re-started.

Six weeks later after a total UVA dose of 53.5 J cm^{-2} the psoriasis was considerably improved but the patient complained of malaise and breathlessness. On examination he was pale, with marked hepatosplenomegaly. Haemoglobin was 6.0 g/dl, platelets 45×10^9/l and white cell count 147×10^9/l, of which 76% were myeloblasts. A diagnosis of AML was made. The patient deteriorated rapidly over several days despite supportive measures and subsequently died.

DISCUSSION

Five types of MDS are generally recognized: refractory anaemia (RA); refractory anaemia with ringed sideroblasts (RARS); refractory anaemia with excess blasts (RAEB); CMML; refractory anaemia with excess blasts in transformation (RAEB-T). The rate of transformation to acute leukaemia varies from $< 15\%$ for RA and RARS, through 30–40% for RAEB and CMML, to over 50% for RAEB-T (5). It is widely believed that genetic insults to haemopoietic stem cells are responsible for proliferation of abnormal clones which subsequently give rise to the MDS (1). Subsequent additional genetic insults are likely to be responsible for inducing malignant transformation. The nature of these insults is uncertain.

The combination of 8-Methoxypsoralen and UVA is mutagenic in human cell cultures (2) and the potential for PUVA to increase the risk of cutaneous malignancies has long been recognized. PUVA induced damage to circulating leukocytes has been demonstrated (6), and this appears to occur during their passage through the dermal vasculature. Since haemopoietic stem cells are known to circulate in peripheral blood (4), they could also be exposed to the effects of PUVA and malignant transformation might occur. PUVA produces changes in circulating lymphocytes (7) and could potentially alter immune surveillance, thereby allowing expansion of malignant cell clones.

There have been occasional published reports of patients developing AML (8), acute myelomonocytic leukaemia (9), and myelodysplastic syndrome (10) following PUVA therapy for psoriasis. None of these patients had preceding risk factors. Our patient with CMML had a substantial risk of developing AML and it is possible that transformation during PUVA therapy was coincidental. However, the possibility that PUVA was responsible for transformation to AML in this patient cannot be excluded.

It is established practice to avoid the use of PUVA therapy whenever possible for patients who have had previous skin malignancies or who have pre-malignant cutaneous lesions such as actinic keratoses or Bowen's disease. We would also urge caution in the uncommon circumstance where PUVA therapy is being considered for patients who have pre-leukaemic disorders.

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Monoamine- and Diamine Oxidase Activities in Psoriasis

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Monoamine- and diamine oxidase activities were measured by a sensitive photometric assay in 25 psoriasis vulgaris patients. Results were compared with plasma histamine values determined fluorimetrically. Increased plasma histamine levels were associated with significantly lowered diamine—and type B monoamine oxidase activities in platelet-rich plasma of the psoriasis patients. Our data suggest that cofactor levels and/or inhibiting factors are responsible for the observed monoamine- and diamine oxidase activities. ***Key words: Histamine, MAO-B; DAO.***

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Attempts to use the activity of the mitochondrial type B monoamine oxidase of the platelets to diagnose mental disease are common, but the results remain contradictory. All attempts to use diamine oxidase for the diagnosis of certain diseases have been unsuccessful until now, because of uncertain distinction between the normal and pathological range.

The preferred substrates of type B monoamine oxidase are benzylamine, 2-phenylethylamine, dopamine, tyramine and, with lower activity, tryptamine. *N*-methylhistamine is also oxidized by type B monoamine oxidase. Diamine oxidase is active on short-chain aliphatic diamines such as putrescine and cadaverine. Diamine oxidase is also a histamine catabolizing enzyme.

We have recently reported low mono- and diamine oxidase activities in atopic eczema patients (1). We now address the question whether these enzymes are also of significance in the pathogenesis of psoriasis and furthermore if plasma histamine levels are related to monoamine oxidase B (MAO-B) and diamine oxidase (DAO) activities.

MATERIAL AND METHODS

Twenty-five patients (age range 17–43 years) with clinically proved psoriasis vulgaris (2) of more than 5 years' duration, as well as 14 healthy volunteers having no history or sign of a skin disease (age range 16–39 years) agreed to participate. The patients avoided all steroid and/or phototherapy for at least 2 months.

Platelet-rich plasma (PRP) was obtained by centrifugation of stabilized (EDTA) blood at 53 g (600 rpm) for 10 min at 20°C. The oxidases were measured *ad modum* Köchli & Wartburg (3), with minor modifications. 0.6 ml peroxidase buffer (8.3 mg peroxidase in 100 ml of 0.1 M sodium phosphate, pH 7.15), 0.2 ml PRP and 10 µl 10% Triton X-100 were mixed; after 5 min, 0.2 ml 0.25 mM 2.7-dichlorofluorescein diacetate dissolved in 0.01 N NaOH and 10 µl 1 mM benzylamine (for MAO-B) or 10 µl 50 mM putrescine (for DAO) were added and mixed. The absorbance at 502 nm was recorded after 15–25 min in a Shimadzu UV-160 spectrophotometer at 20°C. Histamine was measured in EDTA plasma *ad modum* Shore (4), using a Perkin-Elmer LS-2 filter fluorimeter.

O-phtalaldehyde, histamine, benzylamine, putrescine, Triton X-100 were obtained from Sigma, München, FRG; 2.7-dichlorofluorescein diacetate from Serva Heidelberg, FRG and horseradish peroxidase from Boehringer, Mannheim, FRG.