Low Incidence of Polymorphous Light Eruption in Renal Transplant Recipients

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Sir,

Polymorphous light eruption (PLE) is the most common form of photodermatosis and is estimated to affect 15% of healthy people in the UK. The pathogeny of PLE remains unclear (1), however, despite plenty of recent research (2, 3). PLE is characterized by a recurrent, delayed cutaneous reaction appearing a few hours after exposure to ultraviolet (UV) radiation, mostly from the sun, in susceptible individuals. The condition is more frequent in females (4) and often begins in young or middle-aged adults. It is mostly UVA wavelengths that induce PLE, but UVB wavelengths, or both, can also be responsible. Although the prime mechanism of PLE remains unknown, it has been suggested that a delayed-type hypersensitivity response to autologous antigens generated by ultraviolet radiation (UVR) is involved (5).

The aim of this study was to measure the prevalence of PLE in a group of patients with acquired immunosuppression. Renal transplant recipients (RTR) are at increased risk of developing non-melanoma skin cancer due to the additional effects of UVR on DNA and the immunological response, of drug-induced immunosuppression, and human papillomavirus infection (6). In this study, we hypothesized that RTR were less prone to develop PLE.

PATIENTS AND METHODS

As part of the SUNALL project, a European Union commissioned collaborative research programme on sun allergy (7), a prospective study was conducted in our department. With the approval of the local ethics committee (Besançon University Hospital, France), an anonymous questionnaire (see http://adv.medicaljournals.se.....) was given to 180 consecutive RTR who consulted at the Renal Transplantation Unit of the University Hospital in Besançon. No selection was undertaken and all patients agreed to be interviewed and to complete a questionnaire. The questions concerned age, sex, number of renal transplantations, skin type, use of sun protection measures, use of sun protection cream, and occurrence of PLE. In the case of PLE, additional questions to differentiate PLE from other photodermatoses were included (age of onset, delay to onset of rash following sun-exposure, duration of episodes, itch). All RTR received a leaflet indicating the risk of sun exposure and advice on sun protection at the time of renal transplantation. In addition, a pre-transplant dermatological visit was performed for each RTR to inform them about the risk of sun exposure and to perform a baseline cutaneous examination. A similar questionnaire, except for renal transplantation information and sun protection measures, was given to 1200 employees in different departments (medicine, surgery, administration and technical) of the University Hospital in Besançon. The answers were analysed using the χ^2 test.

RESULTS

Of the 180 RTR given the questionnaire, 157 (87%) completed it, as compared with 81% (974 completed questionnaires) in the general population of the hospital. Responders' characteristics are given in Table I. RTR were older and mostly men, compared with the hospital employees. Skin type distribution was also significantly different between the two groups, as 80% of RTR reported skin types III and IV, vs. 67% in the employees group. As expected, women were significantly more affected than men, both in healthy controls (21.3% vs. 4.9%) and in RTR (4.9% vs. 0%). In addition, PLE occurrence was notified by 17.5% of the employees and by only 2% of RTR (p <0.001). All RTR had been informed previously of the risk of sun exposure and the need for sun protection, but 92% used protective measures and only 35% used sunscreen (Table I).

Table I. *Demographic data and prevalence of polymorphic light eruption (%, 95% CI)*

	Controls	RTR
Participants (*n*)	974	157
Age (years, mean ± SD)	29.4 ± 12.5	52.6 ± 12.3
Time post-transplant (years, mean ± SD)	Not applicable	9.5 ± 5.4
Number of transplantations *n* (%)		
One	Not applicable	133 (85)
Two or more	Not applicable	24 (15)
Skin type[a] *n* (%)		
I	56 (5.8)	19 (12.1)
II	300 (30.8)	12 (7.6)
III	528 (54.2)	102 (65.0)
≥IV	90 (9.2)	24 (15.3)
Gender: % female	76.7	40.1
Prevalence of PLE (%, 95% CI)		
Female	21.3 (18; 24)	4.9 (1; 14)
Male	4.9 (2; 9)	0 (0)
Total[b]	17.5 (15; 20)	2.0 (0.4; 6)
Use of sun protection measures (%)	Not applicable	144 (92)
Use of sunscreen (%)	Not applicable	55 (35)

[a]Skin types are classified I–VI according to Fitzpatrick TB, Arch Dermatol 1988; 124: 869–871; [b]p <0.001.

RTR: renal transplant recipient; SD: standard deviation; CI: confidence interval.

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DISCUSSION

Although, this survey focused on patients with PLE, it cannot be excluded that a limited number of responders had other less common photodermatoses. However, all these conditions demonstrated low prevalence in the general population compared with PLE. Photosensitivity conditions may also be of genetic and/or biochemical origin, but again these are rare. Various medications can also cause photosensitivity, although it usually presents as a sunburn response. Even if the use of medications is likely to be higher in RTR than in controls, the low prevalence of photodermatoses found in this study minimizes this bias. It is concluded that most subjects in this study had PLE, rather than other photodermatoses.

UVR is known to induce immunosuppression and is widely used as therapy for skin disorders mediated by abnormal T-cell activation (8). It has been postulated that this immunosuppression prevents autoimmune responses to UVR-damaged skin, in particular to photo-antigens. It is thus hypothesized that, in patients with PLE, there is a partial failure of UVR-induced immunosuppression, causing an abnormal response to these antigens. There is some evidence of the role of immune response in patients with PLE (5, 9, 10). Recently, two studies (2, 3) have demonstrated that a single minimal erythema dose of solar-simulated UV irradiation suppressed contact sensitization less in patients with PLE than in healthy controls. The authors thus hypothesized that patients with PLE demonstrated a resistance to UVR-induced suppression of cell-mediated immunity leading to a T-cell response to a photo-antigen.

As expected, these results demonstrated a very low prevalence of PLE in RTR compared with the normal healthy population (17.5% vs. 2%). It can be argued that RTR, knowing the risk of sun exposure, avoid going outside during the sunny hours, and consequently are not so prone to develop PLE, simply because they are less exposed to UVR. However, several studies demonstrated that despite the fact that most RTR are aware of the need for sun protection, only a minority take adequate protection measures and show compliance with advice about sun protection (11–13). In our study, all RTR were supposed to be aware of the risk of sun exposure, since each were seen by a dermatologist during a pre-transplant visit and received an informative leaflet. Ninety-two per cent declared taking adequate measures to reduce sun exposure, but this result can be questioned since only 35% patients declared using sunscreen. In addition, RTR were also significantly older than control subjects and skin type III was significantly more frequent in RTR. As previously reported (11–12), males were predominant among RTR (60%) compared with the control group (24%). Although skin type is not known to interfere with the development of PLE, differences of sex and age may influence the prevalence of PLE, since PLE seems to occur predominantly in young women (4). However, 21.3% of control women questioned declared PLE compared with only 4.9% of female RTR ($p < 0.001$), and it can be expected that PLE occurrence would be more frequent as age increases.

The low prevalence of PLE observed in RTR raised several hypotheses: (*i*) RTR may be more "UV-susceptible" in terms of immunosuppression induced by UVR compared with patients with PLE. Previous studies have demonstrated genetic differences in susceptibility to UVR-induced immunosuppression in inbred mice and in humans (14). To our knowledge, however, there is still no evidence demonstrating this difference in RTR. (*ii*) Drug-induced immunosuppression may prevent RTR developing a delayed-type hypersensitivity response to autologous antigens generated by UVR. This hypothesis is supported by the fact that immunosuppressive drugs are effective in severe PLE (15). This would mean that the occurrence of PLE requires an intact immune system, thus supporting the immunological hypothesis of PLE (2, 3, 9).

Although we were not able to evaluate the prevalence of PLE before and after renal transplantation, our results add further evidence that immunosuppression linked to renal transplantation enable RTR to develop an efficient immunological response to a potential antigen induced by UVR.

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