

## SHORT COMMUNICATION

# SKIN DISORDERS IN PATIENTS WITH HEMIPLEGIA AND PARAPLEGIA

Ülker Gül, MD<sup>1</sup>, Seray Külcü Çakmak, MD<sup>1</sup>, Sumru Özel, MD<sup>2</sup>, Pelin Bingöl, MD<sup>1</sup> and Kurtuluş Kaya, MD<sup>2</sup>

From the <sup>1</sup>Ministry of Health Ankara Numune Education and Research Hospital, Dermatology Clinic and <sup>2</sup>Physical Therapy and Rehabilitation Education Hospital, Physical Therapy and Rehabilitation Clinic, Ankara, Turkey

**Objective:** The aim of this study was to determine the incidence of skin disorders in patients with hemiplegia and paraplegia. Several skin disorders have been reported previously in these patients.

**Methods:** Seventy inpatients with hemiplegia, 30 with paraplegia, and 90 individuals as a control group were included in the study.

**Results:** The most common skin disorder in the patient group was tinea pedis, which was observed in 18 of the 100 patients. The other common dermatological disorders in the patient group were onychomycosis of the toenails ( $n=14$ ), xerosis of the extremities ( $n=13$ ) and reduction in hair on the lower extremities ( $n=12$ ). The incidence of tinea pedis ( $p=0.004$ ), onychomycosis of the toenails ( $p=0.010$ ), xerosis of the extremities ( $p=0.017$ ) and reduction in hair on the lower extremities ( $p=0.027$ ) in the patient group were significantly more common than in the control group. There was no significant correlation between tinea pedis, onychomycosis of the toenails, xerosis of the extremities and reduction in hair on the lower extremities and the duration of hemiplegia and paraplegia.

**Conclusion:** Dermatological disorders are observed more commonly in hemiplegic and paraplegic patients than in controls, therefore routine dermatological examination should be performed in these patients.

**Key words:** skin, nail, hemiplegia, paraplegia.

J Rehabil Med 2009; 41: 681–683

Correspondence address: Seray Külcü Çakmak, Turan Günes Bul. 71. sokak 18/8, TR-06550 Yıldız Çankaya Ankara, Turkey. E-mail: seraycakmak@gmail.com

Submitted October 27, 2008; accepted April 22, 2009

## INTRODUCTION

Although various skin changes on both the healthy and hemiplegic sides of patients with hemiplegia have been published as case reports or case series, there are no studies investigating skin findings in patients with hemiplegia (1–10). Some studies have, however, been performed in patients with tetraplegia and paraplegia with traumatic spinal cord injury, and these have revealed a high incidence of local fungal infections (11), skin thickening and nail hypertrophy (12). The localization of some dermatological disorders in patients with hemiplegia on only the hemiplegic side has been reported, for example, bullous

pemphigoid (1), scabies burrows (2), finger clubbing (3), as has the localization of some dermatological disorders on only the neurologically healthy side, for example, endogenous eczema (4), Beau lines on the fingernails (5), psoriasis of the extremities (6) and scleroderma (7).

The aim of this study was to identify and define the incidence and types of skin disorders in patients with hemiplegia and paraplegia.

## METHODS

A cross-sectional study was performed, including 70 inpatients with hemiplegia and 30 with paraplegia (30 women, 70 men; age range 19–83 years, median 57 years) who were being followed up in Ankara Physical Therapy and Rehabilitation Hospital. The patients had no other associated diseases that might be complicated by skin diseases. A control group of 90 healthy individuals with matching ages and gender with no associated diseases that might be complicated by skin diseases were selected (24 women, 66 men; age range 18–78 years, median 55 years).

The study was approved by the ethics committee of Ankara Numune Education and Research Hospital. Dermatological examination of the patient and control groups was performed for the diagnosis of dermatological diseases. Diagnoses were made by dermatologists, based on clinical findings and, if necessary, laboratory investigations (dermatoscopy, potassium hydroxide, microbiological and histopathological examinations) were performed.

For statistical analysis a  $\chi^2$  test and Pearson correlation analysis were used.

## RESULTS

The duration of hemiplegia and paraplegia in the patient group was in the range 1–170 months (median 6 months). The aetiology of paraplegia or hemiplegia was: cerebrovascular events in 66 patients, traumatic spinal cord injury in 30, cerebral tumour in 2, hereditary spastic paraparesis in one and scoliosis in one. The most common skin diseases in the patient group were: tinea pedis (18%), onychomycosis of the toenails (14%), xerosis of the extremities (13%) and reduction in hair on the lower extremities (12%). Other skin diseases in the patient group were: toenail dystrophy (3%), contact dermatitis (2%), nummular eczema (2%) clubbing of the fingernail (third finger) (1%), hand oedema (1%), longitudinal melanonychia of fingernail (1%), intertrigo (1%), folliculitis (1%), trachyonychia of toenails (1%) and acne vulgaris (1%). Those disorders occurred on both sides; clubbing of the fingernail occurred

only on the hemiplegic side, and longitudinal melanonychia occurred only on the neurologically healthy side of patients with hemiplegia.

In the patient group the incidence of tinea pedis, onychomycosis of the toenails, xerosis of the extremities and reduction in hair on the lower extremities were significantly higher than in the control group ( $p < 0.05$ ,  $\chi^2$  test) (Table I). There was no significant correlation between these disorders and duration of hemiplegia and paraplegia.

## DISCUSSION

Dermatological findings following traumatic spinal cord injury in patients with paraplegia and tetraplegia have been investigated previously, and local fungal infections (11), clinical skin thickening and nail hypertrophy (12) are observed commonly in those patients. Moreover, seborrhoea below neurological level (13) and Norwegian scabies of the legs have been reported in patients with paraplegia (14). Similarly, local fungal infections were the most common dermatological disease, but skin thickening, nail hypertrophy and seborrhoea were not common in our study. This discrepancy may be due to the different races and geographical conditions in the study groups and the inclusion of patients with hemiplegia in our study.

Several dermatological diseases have been reported in patients with hemiplegia. Unilateral bullous pemphigoid (1), asymmetrical scabies burrows (2), unilateral finger clubbing (3), decrease in the minimum erythema dose of ultraviolet radiation (8), and tendency to tan more easily on the hemiplegic side (9) have been reported. In addition, the localization of some disorders on the neurologically healthy side of patients with hemiplegia has been reported. The localization of endogenous eczema in the neurologically healthy side of 5 patients with hemiplegia was found and xerosis was suggested as an aetiological factor (4). Beau lines on the fingernails (5), psoriasis of the extremities (6) and scleroderma on the healthy side of the body (7) have been reported in patients with hemiplegia. The decrease in cutaneous blood flow and altered autonomic nervous function on the paralysed side are thought to be responsible for some of those conditions (1, 5). The dermatological disorders we observed in patients with hemiplegia occurred on both sides; only clubbing of the fingernail occurred on the hemiplegic side, and longitudinal melanonychia occurred on the neurologically healthy side.

Table I. Frequency of dermatological disorders in hemiplegic and paraplegic patients and healthy individuals

| Dermatological disorder                    | Patients with hemiplegia and paraplegia |                          | <i>p</i> -value |
|--|---|--------------------------|-----------------|
|  | ( <i>n</i> =100)                        | Controls ( <i>n</i> =90) |                 |
| Tinea pedis                                | 18                                      | 4                        | 0.004           |
| Onychomycosis                              | 14                                      | 3                        | 0.010           |
| Xerosis of the extremities                 | 13                                      | 3                        | 0.017           |
| Reduction in hair on the lower extremities | 12                                      | 3                        | 0.027           |

Siragusa et al. (15) studied nail pathologies specifically associated with hemiplegia in 108 patients and found that longitudinal reddish striation, neapolitan nails and unilateral clubbing were characteristically associated with hemiplegia. We observed clubbing of the third fingernail of the hand involving the hemiplegic side in one patient. As pulmonary, cardiac and intestinal disorders that might be associated with clubbing of the fingernails were not present in this patient, we think that clubbing might be due to hemiplegia. The pathogenesis of clubbing of fingernails in hemiplegia is not known. Hypertrophy and oedema of the soft tissues is thought to be responsible for the obliteration of the nail angle, and the autonomic nervous system is thought to play a role in clubbing in patients with hemiplegia (15). We also observed tinea pedis and onychomycosis of the toenails more commonly in patients with hemiplegia and paraplegia, but they were observed in both extremities. Siragusa et al. (15) observed onychomycosis with similar frequency in patients with hemiplegia and control group, onychodystrophy was observed on the unaffected side and in normal controls. The reason for the increased incidences of tinea pedis and onychomycosis in our patients might be immobilization, which may interfere with personal hygiene in these patients (e.g. through reduced ability to dry the skin properly, and less skin airing). We do not know the reason for the increased incidence of xerosis of the extremities and the reduction in hair on the lower extremities, but it might also be related to immobilization as they were observed in both extremities. In addition, nutritional deficiencies in these patients might play a role in the pathogenesis of xerosis and the reduction in hair. In patients who have had a stroke, the reduction in skin temperature of the affected limb, associated with reduced limb blood flow, as well as a reduction in blood flow in the unaffected leg has been reported (10, 16). The reduction in blood flow might contribute to xerosis and reduction in hair in patients with hemiplegia and paraplegia.

To our knowledge this is the first study investigating skin disorders in both patients with hemiplegia and paraplegia. We have found that tinea pedis, onychomycosis of the toenails, xerosis of the extremities and reduction in hair on the lower extremities are commonly observed in patients with hemiplegia and paraplegia. Although these disorders appear to be of little clinical importance, they may be troublesome to the patients. Routine dermatological examination should be performed in patients with hemiplegia and paraplegia to prevent the complications of tinea pedis, onychomycosis and xerosis (i.e. infections, xerotic eczema). Patients and caregivers should be educated about proper skin care (i.e. washing and drying the feet thoroughly, keeping them dry and aired, moisturizing the extremities) in order to avoid those disorders. Further enlarged and prospective studies of dermatological diseases in patients with hemiplegia and paraplegia are needed in order to better assess the incidence and nature of skin disorders in these patients.

## REFERENCES

1. Long CC, Lever LR, Marks R. Unilateral bullous pemphigoid in a hemiplegic patient. *Br J Dermatol* 1992; 126: 614–616.

2. Speight EL. Asymmetrical scabies burrows in a hemiplegic patient. *Br J Dermatol* 1993; 128: 467–468.
3. Alveraz AS, McNair D, Wildman J, Hewson JW. Unilateral clubbing of the fingernails in patients with hemiplegia. *Gerontol Clin* 1975; 17: 1–6.
4. Troilius A, Möller H. Unilateral eruption of endogenous eczema after hemiparesis. *Acta Derm Venereol* 1989; 69: 256–258.
5. Thomsen K. Unilateral skin conditions after hemiparesis. *Acta Derm Venereol* 1989; 69: 544.
6. Pippenger MA, Crowe MJ. Psoriasis contralateral to hemiparesis following cerebrovascular accident. *Int J Dermatol* 1993; 32: 598–599.
7. Sethi S, Sequeira W. Sparing effect of hemiplegia on scleroderma. *Ann Rheum Dis* 1990; 49: 999–1000.
8. Cox NH, Williams SJ. Lowered ultraviolet minimal erythema dose in hemiplegia. *Postgrad Med J* 1985; 61: 575–577.
9. Cox NH. Asymmetrical tanning in hemiplegia. *Practitioner* 1984; 228: 1106–1107.
10. Adams WC, Imms FJ. Resting blood flow in the paretic and non-paretic lower legs of hemiplegic persons: relation to local skin temperature. *Arch Phys Med Rehabil* 1983; 64: 423–428.
11. Stover SL, Hale AM, Buell AB. Skin complications other than pressure ulcers following spinal cord injury. *Arch Phys Med Rehabil* 1994; 75: 987–993.
12. Rubin-Asher D, Zeilig G, Klieger M, Adunsky A, Weingarden H. Dermatological findings following acute traumatic spinal cord injury. *Spinal Cord* 2005; 43: 175–178.
13. Thomas SE, Conway J, Ebling FJG, Harrington CI. Measurement of sebum excretion rate and skin temperature above and below the neurological lesion in paraplegic patients. *Br J Dermatol* 1985; 112: 569–573.
14. Erbil H, Sezer E, Kurumlu Z, Tastan HB. Norwegian scabies of the legs in a patient with paraplegia. *Clin Exp Dermatol* 2007; 32: 347–348.
15. Siragusa M, Schepis C, Cosentino FFI, Spada RS, Toscano G, Feri R. Nail pathology in patients with hemiplegia. *Br J Dermatol* 2001; 144: 557–560.
16. Ivey FM, Gardner AW, Dobrovolny CL, Macko RF. Unilateral impairment of leg blood flow in chronic stroke patients. *Cerebrovasc Dis* 2004; 18: 283–289.