

STUDY OF CUTANEOUS INSENSIBLE PERSPIRATION IN DIFFERENT AGE-GROUP

*R P Okhandiar, **Hem Shankar Sharma, **D P Singh, *A D Mishra

Gradual diminution of cutaneous insensible perspiration is observed with advancement of age which becomes significant suggesting altered stratum corneum, in old age.

Key Words : Perspiration, Stratum Corneum

Introduction

Irritability of the skin associated with, if not caused by, progressive dryness is common in elderly which worsens in winter leading to pruritus.¹ In children, on the contrary, the skin is soft and supple except in pathological states. Softness and pliability of the skin is dependent upon the water-content and water-holding capacity of the stratum corneum (SC)² probably upon its hydro-soluble protein fraction.³ The availability of water to SC is largely a passive diffusion from underlying wet tissue, so-called 'Cutaneous Insensible Perspiration' (CIP) which is itself dependent upon various physiological and pathological states of SC.

The measurement of CIP has been undertaken here, to assess the physiological status of SC in different age group as very little data is available and none from the tropical countries, so far this parameter is concerned.

Materials and Methods

'Unventilated chamber' method is adopted here by which the CIP is measured gravimetrically (monopan electric analytical balance ± 0.1 mg.) recording the change in

From *Skin & Leprosy Institute, Kharman Chak and **J N Medical College, Bhagalpur-812 001, Bihar, India.

Address correspondence to : R P Okhandiar, Skin & Leprosy Institute, Kharman Chak, Bhagalpur-812 001.

weight of hygroscopic salt (fused calcium chloride A.R.) placed in the chamber.⁴

The volunteers were selected from the staff members and their relatives, all males and without any systemic or skin disease. The subjects were divided in four groups according to their age as detailed in table I.

All the experiments were performed in winter months at the prevailing atmospheric temperatures below 22°C, when the sweat glands remain inactive.⁵

Results

The results are shown in table I and in the Scattergram (Fig. I). It can be seen that the CIP values are higher in children below 16 years of age which becomes stabilised between 16 to 40 years (Group B and C in tabel I), and appear to be slightly diminished over 40 years of age (Group D). When the CIP values of Group D is compared with other age-groups, the variation is significant ($p < 0.001$ and $p < 0.05$).

Comments

Although Winkelmann (1969)⁶ commented that individual, regional, age and species difference may account for cutaneous permeability, it is generally agreed that aging has no effect on the passive diffusion of water through the skin⁷ except in preterm infants where SC is incompletely formed.⁸ Although, quite significant changes in dermal

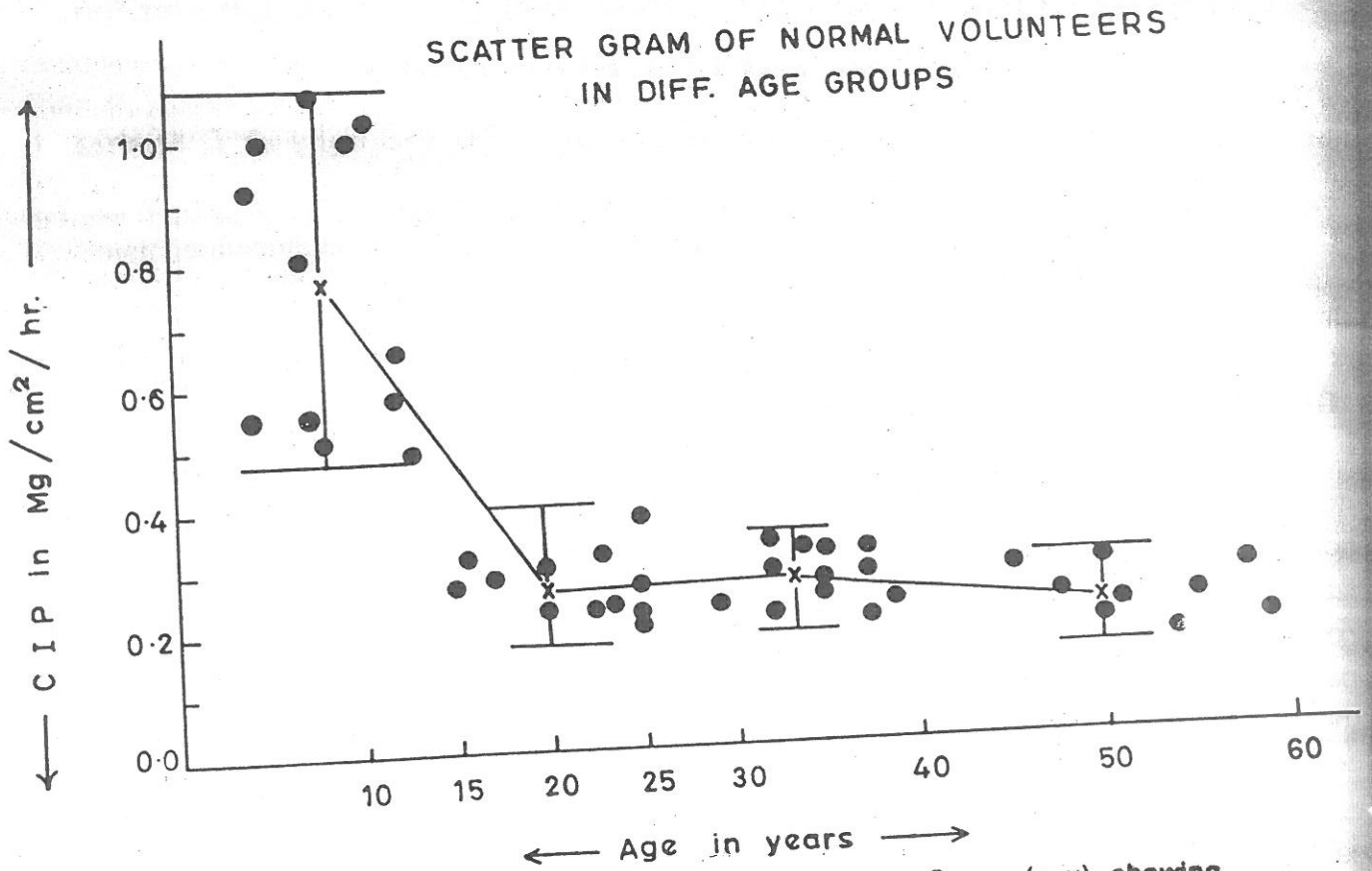


Fig. 1. CIP values () in normal healthy volunteers. Curve (x-x) showing mean values in each age-group.

Table I. CIP (mg/ cm²/ hr) of Normal Volunteers in Different Age Groups

Group A < 16 Yrs (11 subjects)	Group B 16-25 Yrs (12 subjects)	Group C 26-40 Yrs (12 subjects)	Group D 41-60 Yrs (8 subjects)
Mean 0.7771 SD± 0.2253	Mean 0.2730 SD± 0.0477	Mean 0.2732 SD± 0.0441	Mean 0.2209 SD± 0.0445

Student's t-test

GR D	vs	GR A	=	p < 0.001	(Highly significant)
GR D	vs	GR B	=	p < 0.05	(significant)
GR D	vs	GR C	=	p < 0.05	(significant)
GR B	vs	GR C	=	p > 0.05	(Not significant)

collagen and reticulin have been recorded, little appreciable change in SC of aged has been noted inspite of thin epidermis and poor epidermal proliferation.⁹ Some structural changes like decreased keratinocyte dimensions and increased

corneocyte size have been attributed to poor epidermal proliferation by Marks.¹⁰

The present study shows that there is gradual diminution of water-diffusion from the underlying wet tissue to the SC with the advancement of age. Whether this could be

due to poor availability of water or due to defective barrier or poor water-holding capacity of the SC due to a qualitative change in its chemical and physical structure, remains a question which needs further study and evaluation. Moreover, it is too premature to conclude that low CIP would account for dryness of the skin in aged; nevertheless it does remain an interesting observation which needs to be connected with other physiochemical changes taking place in the SC in old age.

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