REVISION CORNER

PHYSICAL & PHYSIOLOGICAL DISORDERS OF SKIN

By

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INTRODUCTION

Skin is the largest organ of the body and perhaps is the only organ which is so directly exposed to stresses and strains exerted by such diverse factors as enviornment, (other) physical factors, chemical noxae and invasion by bacteria and fungi. That inspite of all these possibilities of direct attack, let alone indirect ones, skin in majority of subjects is able to withstand them and maintain its resilience, speaks volumes for its architeture and of course also for the architect, whoever it may be! May be it is a case of adaptation whatever the term may imply, and equally it is possible that this adaptive mechanism gives way in certain cases when disorder or disease begins. What is it that determines various types of disorders to occur? It is not one factor but one may be at liberty, on the strength of experience born out of observations, to postulate that by and large it is the commulative effect of various synergistic factors that determine the occurrence of a disease, e. g. heat, humidity, perspiration and maceration easily predispose to bacterial or fungal infection. How quickly one will yield to the actual occurance of manifest disorder or disease will depend on opposing infuluence from the body itself which go by the time honoured name of resistence. Thus purely from physical standpoint any resistence will naturally collapse before a superior one. In other words before the manifest disease occurs there are a lot of changes going on in an organ under strain of fight. Thus the disease or disorder will be the end picture resulting from these opposing forces operating on the organ or tissue which is under strain of conflict.

Skin is no exception to this general principle. For, skin diseases are essentially similar in their pathology (quite often it is disturbed physiology) to diseases of other organs or tissues. Congenital abnormalities, acquired diseases like inflammations, degenerations and neoplasms all affect skin. But the unique feature of skin is that it is directly exposed to enviornmental changes, physical and chemical traumata, and to invasion by many different micorobes including fungi and viruses. Many so called skin diseases are, in fact, physical changes or physiological reactions which have become fixed or which are excessive and too easily induced; others are pathological reactions of the skin to various agents. And here in this section we are concerned with the newly evolved or rather grouped subjects of Physical and Physiological Disorders of Skin.

PHYSICAL & PHYSIOLOGICAL DISORDERS OF THE SKIN

This is rather an arbitary classification of skin disorders. However it has the advantage of being based on known physical and especially physiological disturbances

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of function. In order to understand these disorders, it will be of paramount importance to have some clear idea about the structure and function of skin.

Physical Disorders: Here we are concerned with disorders from changes in physical contents or the structure of the skin and its adnexa.

At this stage it will be quite in order to point out some of the peculiarities of skin diseases in general and which are very much applicable to the subject under discussion. They are: (i) direct contact with enviornments (ii) patients can see skin diseases directly (iii) itching-scratching cycle leads to infections and lichenification of skin (iv) self treatment and resultant overtreatment may mask the original condition and (v) many skin diseases are physiological reactions.

Thus we encounter following conditions (i) hypertrophy (ii) atrophy (iii) dry skin etc.

Anatomy; Skin is the largest organ both as regards weight and expanse.

Structures and Function (*Anatomy and Physiology*): Its structure varies in different areas; thus it is thickest in palms and soles and thinnest in eyelids and prepuce. Skin is a soft fexible, membranous covering which completely invests the body and is continous at the natural orifices with mucous membranes. Histologically skin consists of (1) Epidermis (2) Dermis and (3) Subcutaneous tissue.

Epidermis: It is the superficial layer of skin ectodermal in origin. It provides the protective covering for the entire body surface and gives it shape and appearance. It consists of serveral layers of cells arranged as the deepmost basal or germinal layer and the upper most horny layer. The basal layer produces successive layers of malpighian cells, called prickle cell layer, granular layer and finally horny layer. It is this horny layer primarily and epidermis as a whole that provide the first line of defense against various trauma. The epidermis is thrown into folds and is apposed to the papillated surface of underlying dermis. Basal membrane conjoins the epidermis and dermis and behaves like a collagen gel. The papillae give rise to wrinkles. It is this papillated pattern which gives rise to wrinkles, furrows and ridges on surface of the skin. The adnexal glands in the dermis or the corium communicate with the surface through pores on these ridges. It is again the basal layer of epidermis which is the seat for maximum collection of melanin pigment which mainly determines the colour of the skin.

Dermis: Or corium consists of connective tissue framework, incorporating elastic tissue, blood vessels, lymph vessels and nerves. It is the dermis which becomes leathery when tanned. It is thickest on soles, palms and back; and thinner on eyelids and prepuce. As pointed out dermis has superficial papiliary layer which supports epidermis. This papilary layer aslo provides nutrition to epidermis in the form of tissue juice, for the later is avascular. It is in the dermis that hair follicles are situated. The sweat glands also called the coil glands are situated deep in the dermis or even in subcutaneous layer.

PHYSICAL DISORDERS

I Hypertrophies: Histologically hypertrophy may involve overgrowth of different layers of skin singly or in combination.

A. CONGENITAL AND HEREDITARY

(*i*) *Tylosis*: Tylosis is a fairly common condition. It is sometimes familial. It is congenital hyper-keratosis of palms and soles. It becomes worse in winter when cracks and fissures may occur with possibility of secondary infection. It may become macerated in summer with offensive smell. *Treatment*: Vit A and local keratolytic ointments are useful as palliative agents.

(*ii*) *Porokeratosis of Mibelli*: It is a peculiar type of keratosis of uncommon incidence. It particularly affects sweat ducts ostia. Lesions begin as warty papules which enlarge peripherally with central atrophy. Its peripheral border is characteristic. It has double horny ridges with a grove. The common sites affected are hands, face, neck etc, Its course is very slow.

Etiology: Cause is unknown, usually males are affected. Heredity may be a factor. Treatment is surgical removal.

(*iii*) *Keratoderma Punctetum*: It occurs in 2 forms. Hereditary form manifests in adult life. Acquired variety occurs around sweat ducts. There are conical or rounded warty papules with central puncta usually on the palms. 5% salicylic acid ointment is used to soften the lesions.

(*iv*) *Nevus unius lateris or Icthyos is hystrix*: It usually occurs as linear rough keratotic band on the extremities or body. Histologically there are no nevous cells present. Warty nevi may be present at birth or appear any time before puberty and then persist. Epithelioma may supervene. Treatment is surgical excision and skin grafting.

B. ACQUIRED HYPERTROPHIES

(i) *Corn (clavus)*: It is a very common skin condition.

A corn is a localised hypertorphy of horny layer in response to intermittent pressure and friction. This hypertrophy is typically conical with apex pointing towards dermis and causing pain by pressure on nerves in dermis. Corns usually occur on toes due to illfitting shoes but may occur elsewhere also. Exostoses of metatarsal bones may also cause corns. It is diagnosed by X-ray of feet.

Treatment consists in repeated paring of the horny layer and application of collodion salicylate. Sometimes Vit. A may help. Proper footwear is necessary for prevention.

(ii) *Callosities*: They are diffuse hypertrophy of horny layer and without downward projection as in corns. They are caused by excessive weight bearing as in obesity and unnatural pressure as in pes planus. Any type of intermittent friction may also cause them e. g. on eye brows and knees in Muslims due to their prayer posture; occupational stigmata in cobblers, gardners, boatmen, housewives

and others. They are painless but may become painful on fissuring and infection. Treat- ment is same as for corns.

(iii) *Keratoderma climactericum*: Occurs in menopausal women affecting palms, soles and heels. Treatment is by oestrogens.

(iv) *Arsenical Keratosis*: Usually due to Fowler's solution which is not used now a days. There are pinhead size lesions on palms and other sites. Basal cell epithelioma may supervene.

(v) *Keratoderma Blenorrhagica*: It consists in limpet like scaly crusted keratotic lesions on soles and palms producing relief map appearance. It may occur beneath nails also. It is really a component of the Reiter's Syndrome or non-specific urethritis. Local treatment is by keratolytics. Treat the urethritis by broad-specturm antibiotics.

(vi) *Lichenification*: It consists in hypertrophy of prickle cell layer called acanthosis. The skin is thickened with exaggeration of normal creases. It occurs typically on neck as neuro-dermatitis circumscripta.

(vii) *Cutis laxa*: There is hypertrophy of skin and subcutaneous tissue with the result that skin hangs in folds.

II ATROPHIES

Here the different layers of skin are thinned out with flattening of papilae. It occurs in aging skin but more so in skin exposed to light. The atrophic skin is thin, wrinkled, tissue papery in appearance and texture, yellowish and it has lost elasticity.

A. Congenital conditions: Familial and Hereditary:—

(i) Pseudoxanthoma elasticum.

There is congenital defect in elastic tissue of skin, retina and arteries though collagen is normal. Skin lesions consist of yellowish brown papules or plaques usually on neck. They can be lifted and stretched by fingers. There are angoid streaks in retina.

(ii) Cutis hyper elastica (Ehlers-Danlos Syndrome). In this there is con- genital hyper-elasticity of skin, hyper-flexibility of joints and scarring over elbows and knees. The patient shows double jointedness and is able to stretch the skin excessively. Histologically there is increase in elastic tissue whereas collagen is atrophic and disrupted. Treatment is protective.

B. Acquired conditions:

(i) Senile elastosis (peasant's skin)

It is a leathery skin with marked furrowing especially on nape of neck.

(ii) *Golossy skin of trophic atrophy*: It occurs in parts whose nerve supply is cut off. It is common in leprosy in our country.

(iii) Pressure atrophy : It occurs at sites of continuous pressure e. g. under pads of trusses, crutches etc.

(iv) Vulval atrophy (senile atrophic vulvitis). Vulval opening may be narrow (Kraurosis vulvae) is dry shiny and smooth with itching. Leucoplakia and even carcinoma may supervene.

(v) Macular atrophy.

It may be idiopathic or due to past secondary syphilis, leprosy, lupus erythematosus, morhpoea etc. Clinically there are hernia like orifices and grape like swellings in skin.

(vi) Macular striate atrophy : It occurs in linear form affecting abdomen, breasts and thighs in pregnant women, also in Cushings syndrome and some obese people of either sex. There may be itching in these striae and the latter may be sites of severe uritcaria and erythema.

(vii) Atrophoderma Reticulatum or ulerythema ophryognes. Occurs on cheeks. Cosmetic camouflage is the only treatment.

(viii) Acrodermatitis chronica atrophicans. It affects chiefly the extremities where the skin is brownish red and swollen, later becoming atrophic and wrinkled, with subcutaneous veins clearly visible. There may be fibrotic bands or nodules along ulna or tibia. Penicillin may bring about remission.

(ix) Poikiloderma : It is an atrophic precancerous condition characterised by intermingling of telengectasia, pigmentation and atrophy.

Causes : (a) idopathic poikiloderma vasculare atrophicans of Jacobi-Lane type which may terminate in cutaneous reticulosis (b) after excessive solar or X-ray irradiation.

Course : Watch for mycosis fungoides, keratosis or cancer.

Diagnosis : In idiopathic form there may be lichenoid papules on the trunk and with parapsoriasis like patches in addition to poikiloderma.

Treatment. Bland local applications e. g. Ung. Aqua Rosae.

(x) Lichen sclerosis at atrophicans.

Icthyosis : (Xeroderma, fish skin disease)

Ill Dry skin etc. e. g. Physically speaking it is dry skin of congenital origin. Histologically it is one of the hypertrophies restricted to horny layer. Besides in the corium there is absence of sebaceous glands. The number of sweat glands also may be reduced. In its milder form it is a common condition. There is an acquired type also.

Clinical Picture : The condition becomes soon apparent after birth. Typically there are brown black scaly lesions which being polygonal produce a sort of mosaic pattern. Follicular papules may be present. The lesions are distributed on extensor surface of limbs and when present on flexors, those of the cubital and popliteal fossae are spared. The patient feels his skin dry and tight especially in winter, when the condition becomes more marked. These patients are more susceptible to chapping, contact eczema, and pyogenic infections.

Etiology: The disorder is inherited as a simple dominant characteristic. In acquired type, vitamin A and protein deficiency may be responsible. Besides neuritis like leprosy may produce a similar picture in restricted area especially on legs. Leprosy has to be particularly remembered in our country.

Course: Xeroderma tends to improve at puberty, only to get worse with advancing age. It also shows some improvement in summer. But the patient may feel worse or even heat stroke in summer if sweat glands are also absent.

Treatment: No specific remedy. However much can be done for relief. Warm clothing, warm baths and emollients locally help a great deal especially in winter. Cocoa butter or lanolin serve the purpose. The former is a time honoured remedy in our country. Internally Vit. A 50,000 or 100,000 units daily and thyroid extract ½ gr. may be tried.

(*To be continued*)

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