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Psoriasis: with special reference to its etiology and treatment

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Psoriasis: With Special Reference to its
Etiology and Treatment.

Presented to the Faculty of The University
of Nebraska College of Medicine as partial
fulfillment of the requirements for the
Degree of Doctor of Medicine.

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Omaha, Nebraska

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INTRODUCTION

Since diseases of the skin are among the most frequent diseases to which man is heir, and since they seem so trivial and non-treacherous in comparison to the general medical and surgical diseases, I believe that they are not sufficiently emphasized to the student of Medicine. Since these diseases constitute a great part of the general practitioner's work, and interest should be aroused in the basic years of medical teaching; it is with this interest in mind that I have selected one of the more common of the dermatological diseases, in order to attain a better insight into these diseases in general.

I do not choose to discuss this subject in the attitude of a specialist in that field, but rather as the student of general medicine correlating the older ideas with the recent work and advances made in this field. I believe this to be not only practical but very worth while and time well spent. In this article I shall endeavor to stress mainly the etiology and theragnosis of the disease because it is the causal factor or factors and the eliminative means with which the actual practitioner is primarily interested. It is with these things in mind that I wish to review the literature on the subject of psoriasis.

HISTORY

It is evident that at the beginning of the world mankind was obliged to consider the question of medicine, but centuries rolled by before medicine became a profession. From the earliest times diseases of the skin have been ranking high in the practice of medicine, for skin diseases obtrude themselves upon the attention in a way that few others do and none of man's medical efforts can have been much earlier than those attempting to relieve his itching and to get rid of the sores and scales and parasites that affected his skin. It does not seem mankind's nature to cultivate such amicability.

These speculations about dermatology are supported by the emphasis given to skin diseases in the earliest ancient records. Pusey (38) tells us in his "History of Dermatology" that the old Edwin Smith papyrus and the Ebers papyrus devote much of their space to skin diseases. The Bible refers to many such as leprosy, the "issue" and several plagues visited upon Israel; yet these diseases are so vaguely alluded to that it is impossible to identify them with any latter-day equivalents.

Psoriasis has apparently been among the most ancient of even these skin diseases. Modern dermatologists contend, and it is quite widely upheld, that biblical leprosy (6) of which Naaman was healed by dipping himself "seven times in Jordan", and which was transferred (in the folk-lore sense) to Gehazi so that "he went out from his presence a leper as white as snow" was, in reality, psoriasis. This disease has remained until this day as presenting as many of the serious troubles of diagnosis and treatment as any disease to which man is heir.

We find that it remains rather an obscure disease or at least definitely confused with other dermatological diseases of similar character for years, even centuries, before any definite action is taken to propound it as a definite entity.

According to Pusey (38) Celsus (25 BC - 50 AD) was the first man to ever describe psoriasis with recognizable accuracy. He propounded to great length on diseases in general but devoted much of his time purely to dermatology.

There seemed an apparent waning or lapse of interest in psoriasis then until late in the eighteenth century when Robert Willan, according to Garrison (54) published his series of articles on "Cutaneous Diseases" and which Thomas Bateman finished. In this series of works psoriasis became for the first time definitely catalogued in a good classification of dermatological diseases. Shortly after this Gilier (1797-1866) (54) described definitely pityriasis rosea and set aside quite distinguishing characteristics of the diseases including psoriasis, that were closely related. Goodman (19) accords much credit to Precssnitz, a German farmer who brought out some of the treatments still in use, and to Chard, a Frenchman who likewise carried out quite extensive studies on this disease.

These works constitute the highlights of psoriasis; from this time on through the nineteenth century and into the twentieth the advances have been more to specific points in the disease entity itself. Recently, especially since 1900, many articles have been published dealing with honest efforts and hard labors in attempting to disclose the etiological factors or factor, and through this to arrive at some more satisfactory mode of treatment of the disease. These shall be taken up in the main in the body of this article.

ETIOLOGY

The question of the etiology of psoriasis is an immensely broad subject. It has been worked on since the beginning of Medicine, we might say, and for the number of workers in these fields, we might almost say that there is an equal number of theories, just as diverse as the men themselves. The etiology of this disease is, as in every disease, very important. The best clues as to treatment have come through etiology of the disease in question. It can well be understood that, since there is such a diversity of opinion as to this subject, that cause has not been found or if found has not been adequately proven.

This variety of opinions as to the etiological factors may be said to include everything common to any of the dermatological diseases. Age, sex, occupation, social conditions have been ravaged pro and con throughout the history of psoriasis, and still we have men who emphatically believe one or another of these is the cause or a predisposing cause. But there are others, and by far the majority, who believe these have little or nothing to do with the disease. Pollitzer (35), Schamberg (42) and others are leading proponents of this attitude, and through their noble efforts, they have succeeded in convincing many of the leading dermatologists of their correctness.

Heredity is a subject that enters into the etiology of almost any disease. Although we know that diseases cannot be transmitted hereditarily, yet we must admit at least an hereditary predisposition or weakened condition of bodily tissues especially with reference to certain specific diseases, and psoriasis may be one. A study of this phase of psoriatic etiology must of necessity be quite confusing because of the existing data. This data is suggestive of such an hypothesis yet it is seen in so few instances that again we wonder if it really has any meaning. Knowles (22) has instituted one

of the various inquiries into this subject. He concluded that psoriasis is not hereditary and that only rarely is more than one case found in a family. Only six instances of "psoriasis families" have been discovered by him in some hundreds of cases examined.

Engman (11), however, in the publication of his family psoriatic tree leads an almost exactly opposite view. In this family, he uncovered a history of fourteen cases of the disease in six generations of the family. This would seem almost proof of at least an hereditary tendency. The fact that this is a very rare occurrence tends to nullify the observation. Stelwagon (45) believes that this even apparently heredity is more likely to indicate a likelihood of communicability than actual heredity, and hints at the possibility of a parasitic cause. Pusey (37) seems to agree in the possibility of heredity being very important; though it may be only the hereditary susceptibility. It is also held by man that heredity may play its part in such systematic manifestations as gout, rheumatism, arthritis, etc., which indicate a constitutional weakness and also, in themselves, tend to weaken the individual. Most of the recent workers (Schamberg, Kolmes, Raizess, Ringer etc) tend to disprove these idease in their experiments.

The humoral theory or the theory of a weakened systemic condition, as in gouty, rheumatic or arthitic individuals, which would seem to provide an increased susceptibility is another theory advanced. Parkhust (33), Schamberg (43) and many others however point out that it is more often/^{than} not found in the most robust type of individuals. Beinhauer (4) believes that focal infection, constipation, glandular disturbances, etc., either alone or in combination are apparently very important etiologic factors, or at least factors hindering recovery, because so frequently the disease seems to clear up with the care of these allied, or should we say, associated conditions. Metabolism may also play a part. Burnett (8) lays great stress on "intestinal indigestion" and the absorption of metabolic products. He feels that

most cases can be controlled by diet. Diet, to Pollitzer, (35) is practically out of the question for, as he points out, treatment in Germany and Austria is just as good as in America, England and France, and the latter use diet extremely in treatment while the former consider it not at all.

Another theory which ranks high in its number of supports is the neurogenice or neuropathic. This theory is an altogether plausible one, for it has much data in accord with its principles. Its association or relation with arthritic disease tends to point to some nervous origin; it often seems to appear and often even to start at points of cutaneous irritation; sometimes, though rarely it seems to be limited for a time at least to a regional nerve distribution; its occurrence during pregnancy and lactation or following emotional attacks, and the occurrence of associated sciatica and prickly sensations in the ends of the fingers and toes all point to a neurogenic viewpoint. Ravogli (39) is one of the leading proponents of this theory in this country. It may be said he leans to this theory, but he does state that nothing evolves from nothing and that if the eruption has its origin in the nervous system there must be a serous effusion, an infiltration or hardening of some sort in the meninges which causes irritation of the nerves which control the nutrition of the skin. This is, in the main, in accord with the ideas of Unna (49) who believes there is primarily a weakened vascular tone of neurogenic origin, and with those of Weyl (52) who attributes it more to the functionally weak nervous centers regulating the nutrition of the skin. Ravogli points to the embryonic development of the skin and central nervous system from the identical blastodermic membrane and assumes an ever present close relationship between these two structures. It is said by some that syphilis poisons the organism and when transmitted congenitally, the nervous system and skin are mostly affected. In tainted children apparently in good health the nervous system and skin show a peculiar weakened condition and the latter is subject to pemphigoid or hyperkeratotic eruptions as, for instance, pemphigus of the

palms and soles. This relationship between the central nervous system and the epidermis, as the result of congenital lues has been remarked about by numerous investigators none, however, go quite as far as Ravogli in stating that the syphilitic virus produces alterations in the central nervous system, which later on, causes the psoriatic manifestation on the skin. Kuznitsky, Polotebnoff, Besnies (24) and others experimentators, in general agreed with this theory.

But the theory which has the most followers and seems to be the most logical of all the theories is the one pertaining to the parasitic idea of disease. The more that research is being carried out in this disease, the greater is the tendency for the greater dermatologists to lean toward this theory. There is no absolute proof of such an origin but it is strongly suggested in many ways. Lang (25), according to Ormsby (32) was probably the first to discuss this phase of the subject; he described a fungus, which he named epidermophyton that he believed to be the cause of the disease. His findings were confirmed but later overthrown as have most of the researches along this line.

Numerous attempts have been made to transmit the disease by direct inoculation which would seem easy if the disease were parasitic in origin; however these attempts, in the main, have failed. Bestot (6) apparently succeeded in inoculating himself from an infant with vaccinal psoriasis, and previous experimentators had had some luck at inoculating animals with the disease. Lang (25) apparently was able to show transmissibility from man to rabbits by means of injections blood lymph and psoriatic scales from a human subject. Numerous other investigators have tried these methods, however, and have obtained negative results. Schamberg (41) Pollitzer (36) etc., too, are among those heavy investigators that have failed in this respect.

This theory is strongly suggested by the fact that psoriasis not infrequently follows vaccinations and various injuries, and this was particularly

emphasized by Weinstein (50). Winfield reported six cases in which psoriasis developed with or upon the lulls of attacks of acute tonsillitis, varying from the usual types to the streptococcus types and in one case a tonsillectomy was done. He does not lay any particular importance to this though it does seem to help the parasitic theory or at least indicate a toxic manifestation if not a parasitic one.

The fact that borders of patches seem to melt away when in contact with another suggests an at least temporary immunity which again suggests parasitism. Similar to this is the susceptibility of the patches to exposure to active rays of the sun or ultra violet and x-ray. Schamber (41), Stelwagon (45) and Ormsby (32) believe the disease is much more prevalent in the winter months and in cold climates and it is in fact popularly contended that this is true and diseases of this type are usually parasitic. Sutton (46) does not state outright that he endorses this theory but it may be seen that he leans that way because he states that eradication of focal infections lends to prompter disappearance of the eruption.

Various organisms have been isolated and believed the cause of psoriasis since Lang's epidermophyton. Miss Mary Marcus (30) by elaborate cultural means of ruling out the commoner bacteria found in a series of forty psoratics, that 95% of them had demonstrated strains of sarcinae, which she thinks may be the cause. This has never been quite verified however. Pollitzer (36) and his co-workers believe psoriasis is most probably due to an external microbic agent, though they will not go so far as to state the specific one. Schamber, Kolmer, Raizess and Ringer (44) ran experiments on a series of cases. They found nine out of forty-eight cases had positive Wasserman with alcoholic extracts of luetic liver, 287 of another series was positive with cholosterilized alcoholic-extract of human and beef heart, and that though some evidently had lues, not all of the positives by any means were luetic. They also cultured sixteen different organisms from twenty-four cases, but none appeared to them

etiological. A diplococcus "X" was found in five lesions and seemed to them to have a possible relationship. Goeckerman and O'Leary (16) in their extensive study of Erythroderma Psoriaticum proved to their own satisfaction that in 14 of the cases arsenic internally and local irritant drugs or both were responsible. In these cases intercurrent infections seemed to be responsible and in one a pregnancy seemed to be the existing cause. In the other cases no cause could be found. It would seem here that these cases, from whatever cause, were stimulated by the processes mentioned.

Pollitzer (35) is a great advocate of the parasitic theory. He quite emphatically states that rheumatism, gout, neurosis and heredity are not direct etiological factors in the production of psoriasis, but in the present state of our knowledge it can either be denied or affirmed that they may have some bearing on the obscure condition of the system which renders it more or less susceptible to this "specific infection." He believes psoriasis to be a member of a group of parakeratoses to which seborrhea corporis, and in part, eczema seborrhicum belong. He states that it is most probably due to an "external microbic agent". He is much opposed to the neurogenic and lactation and pregnancy theories. He thinks heredity may play a part, but mainly, compares our present views of psoriasis with those of a hundred years ago concerning scabies, which was definitely believed caused by a "fermentescible substance" or the "Acrid principle."

Schamberg (43) is perhaps one of the greatest advocates of this theory, but he states that it may possibly be (1) the result of circulation in the fluids of the body and deposition in the skin of a micro parasitic analogous to which is observed in syphilis and variola, but that due to the fact that psoriasis is often in people of perfectly healthy constitutional conditions, it is extremely likely. He states (2) that it may possibly be due to implantation upon the skin of an exogenous parasite as is observed in ringworm, favus, and tinea vericolor. He attempted to culture such lesions but got no constancy with the organisms so he discounted his observations. Staphylococcus albus, Bacillus mesentericus, and a yellowish sarcina were the important ones. He states also (3) that

the diseases may be due to one of the common facultative parasitic organisms ever present on the skin, in an individual in whom a constitutional predisposition renders the soil favorably. There is much evidence seeming to support the latter such as the fact that lesions fade when in contact with a previous site of a lesion indicating local immunity. On the other hand it is agreed by most authorities that psoriasis is not a contagious disease. Schamberg attempted auto-innoculation on twenty-three psoriatics and he met success in only three of the twenty-three cases. This is not so flattering but yet it would seem to impart a bit of flavor to the parasitic theory.

And this is about the present status as to the etiology. There are numerous investigators working on this at the present time, but nothing definite can be stated. Who knows, though, but that the next few years, or perhaps even months, may be so revealing as to place this disease in as understandable a category as even scabies rests today?

Symptomatology

In typical evolution the papules and plaques of psoriasis always are sharply defined from the surrounding skin, somewhat infiltrated slight elevated, and covered more or less completely with silvery-white or mother-of-pearl colored scales, which are arranged in thin layers like mica. On removal of the scales, there is exposed, in recent lesions, a bright red surface; in older lesions the color is of a duller line. If the deepest scale, which is often thin, translucent, and closely adherent, is pulled or scraped off, there can be seen several minute bleeding points, which correspond to the apices of the papillae beneath. The lesions vary greatly in number, size, shape, and distribution, but the type (that of the dry papule or plaque covered with scales) always remains the same; so that in uncomplicated cases psoriasis is a distinctly dry disease, without vesicles, pustules, or other moist lesions.

The primary lesion of psoriasis is a pinpoint to pin-head sized flat or oval, sharply defined, slightly elevated, red papule, which always at the earliest moment of observation is covered either entirely or all but a narrow rim at the border with delicate silvery-white or mica-white scales. Ormsby (32) and Andrews (1) agree with this description but Sutton states the primary lesion is a macule or at least a maculo-papule. Bleeding points produced by forcibly removing the scales may be so minute that they are only visible with the aid of a lens. As the lesion grows peripherally, it may become somewhat more infiltrated, slightly more elevated and covered with more abundant imbricated scales; but otherwise it retains its original characteristics. Larger plaques and areas are all formed either by the gradual increase in size of the original papules, or by the coalescence of a number of papules or smaller plaques. The small plaques formed by the peripheral growth of single papules are usually round or oval, but areas formed by the coalescence of smaller plaques are irregular in outline.

In a given case the lesions may be of fairly uniform size, but more commonly, if at all numerous, they exhibit different stages of development and therefore vary in size. They may be arrested at any stage of growth, and persist for months or years as guttate mummular or larger plaques; or by continual extension and coalescen, form areas covering an entire region of the body. Though cases are reported in which the surface of the entire body is covered, it is rare that areas of normal skin cannot be detached.

In number and distribution of it, lesions and in its course psoriasis varies greatly. The disease commonly begins with one or two small papules, which increase slowly in size. In ordinary cases new lesions appear during the course of weeks, months or years, until there are from ten to one hundred or more patches of varying size scattered over the body. It is not unusual, however, for the disease to remain for years limited to two or three coin-sized areas situated commonly over the elbows and knees. Occasionally, a single patch may persist indefinitely without the appearance of others. In other instances but chiefly in recurrences of the disease a large number of punctate paules may appear within a few days; and at times even a generalized acute attack occurs. In the same individuals the number, size and distribution of the patches vary from time to time. With many patients psoriasis areas partially or wholly disappear in the summer only to return in cold weather. In a small number of cases the disease is worse in summer and better or entirely absent in winter. Without the influence of climate of any other known causes, the disease may disappear, partially or wholly, for months or years and then return. In recurrences of the disease, the lesions do not necessarily correspond in number, size or distribution with those of earlier attacks. In acute Febrile and other intercurrent diseases, patches or psoriasis may fade or disappear temporarily.

In distribution psoriasis is, as the rule, symmetrical, but exceptions

are
to the rule occur. The sites of preference of the disease/the extensor surfaces of the extremities, especially about the elbow and knee, in which situation it is decidedly most common. After these locations should be named in order, the scalp, the region of the sacrum, the upper thorax, the face, the abdomen, and the genitals, more rarely the hands and feet.

Upon the scalp, plaques of well-defined contour, covered with thick whitish scales, may meet the hair, but alopecia rarely results often a fillet or band one or two inches in width projects beyond the border line of the scalp over the forehead. When the vertex is bald from physiological loses of hair, the patch of psoriasis usually lingers near the fringe of hair left at the sides of the head, projecting thence to the regions of baldness. On the face the lesions are usually indistinct and small in size, being displayed over the cheeks, chin and nose, avoiding parts near the mucous orifices. In the genital region, also the lesions are usually small and indistinct, and over the scrotum psoriasis is usually complicated by fissures, moisture, and other evidence of acute inflammation.

The hands, feet, fingers, and toes are not often involved, and the palms and soles only rarely. Ormsby (32) reports two cases in which the disease was limited to the palms for considerable periods of time before the appearance of characteristic lesions on other parts of the body. Other writers report similar instances. In many cases the nails are attacked, being thickened, eroded in points, irregularly laminated, rigid, brittle, and yellowish-white or dirty-whitish in color. The nail alone may be attacked. On the palms and soles the lesions may show, instead of scaling sharply circumscribed arease with the horny layer much thickened, occasionally bulluous lesions develop in these regions.

Psoriasis rarely affects the mucous membranes. The lesions of psoriasis linguae are usually those of leukoplakia buccalis, or "Smoker's patches," of syphilitic disease of the mouth or of flat epithiomata. In cases of this

sort, quite often the diagnosis is made histologically. (51).

In a patient subject to psoriasis, a local irritation such as a pin scratch or a mustard plaster, may cause new lesions to appear at the site of the irritation. Crocker (10) describes a form of psoriasis punctata in which the lesions though numerous, are limited to the sweat ducts; and another form of punctate psoriasis in which the papules are situated about the hair follicles.

The amount of scaling varies in different persons and in the same individual. Ordinarily the scales are abundant and thickly heaped up over even small areas. Free perspiration, friction by clothing, or frequent bathing may prevent the accumulation of scales on areas where they would otherwise be abundant. Where the epidermis is thin, the scaling is less; therefore over flexor surfaces, near mucous orifices and on the back of the hand the scaling is less than over the extensor surfaces and other regions. The scaling is more pronounced in advanced years. The scales may adhere with considerable firmness to the patch, or may be shed freely from the surface, in pronounced cases powdering the clothing of the patient or the sheets of the bed upon which he reposes at night. As a rule the scales are disposed over the entire patch, extending slightly, beyond the margin.

Instead of a lustrous white, the scales may display a deep yellowish shade; and instead of being imbricated they may form a continuous sheet of exfoliated epidermis. When the eruptions are disappearing, the scales fall, leaving a pigmented or slightly discolored patch of integument.

Psoriasis is essentially a chronic disease, but may present at times acute exacerbations, and occasionally begin an acute process. In the acute stages the inflammatory symptoms are more marked and the lesions are of a brighter red color, and not so sharply defined as in the ordinary forms of the disease. The scales are fewer in number, thin and easily detached, and the sensations of burning and itching may be severe. When acute, the papules are usually numerous and punctate and may occur on the face. In other instances, the patches may be as large as a small saucer; are dark or livid-red over the whole area; and are

covered with a more uniformly constituted, thin, squamous film or sheet of transparent, delicate membrane, through which the red glare of the patch beneath is visible. This condition may be seen also in young person to whom arsenic has been administered for relief of the disease, with the production of irritative effects. An acute attack may come and go as such, but usually it terminates in a chronic form of the disease.

Subjective sensations may be entirely absent in psoriasis, even when it is extensive. There is, however, usually slight, but occasionally severe itching. In acute cases burning and smarting are often present. In exceptional cases the subjective sensations interfere with sleep and rest; otherwise the disease does not affect the general health of the patient.

Atypical and complicated form of psoriasis occurs in which the character of the lesions is modified considerably. Rarely the scales may be heaped up in the center in the form of an oyster shell (Psoriasis Ostracea). In a few instances, the accumulated scales have assumed the appearance of a cutaneous horn. Occasionally, sufficient thickening occurs to produce a wart-like appearance (Psoriasis verrucosa). The scales may be slightly greasy and the surface beneath exhibit a trace of moisture, making the diagnosis between psoriasis and dermatitis seborrhoica difficult if not impossible. Indeed, some writers think the two conditions may be identical (Ormsby, 32), (Marcus, 30). Occasionally, in moist situations, or sensitive skin of children, or as an effect of local irritations or infections, the patches may be acutely inflamed and indistinguishable from ordinary eczema. Occasionally eczematization of the lesions occurs.

There is an important variant of this disease known as pustular psoriasis which does not signify a secondary infection implanted upon the disease but is a particular type of the disease. It may develop in the course or actually start out as this type. Barber (2) described a type of this which involved the palms and soles. Distribution is apparently very important in these types for it is usually on the thenar eminences and inner sides of the insteps. Tonsillar

infections seemed to be quite important in most of Barber's cases.

Sequellae of psoriasis are as a rule, nothing more than transitory pigmentation, but scars, Crocker (10) keloid formation, persistent, deep pigmentations or permanent achromia having been reported. Some of these are undoubtedly due to treatment though. Epitheliomata may also occur. (White, 53), Schamberg (41). General exfoliative dermatitis occasionally is seen in the course of the disease. Goeckerman and O'Leary (16) found the histology of psoriasis in cases like this precipitated from arsenic therapy.

PATHOLOGY

The pathogenesis of psoriasis is another problem that has not been settled. Some authorities believe the initial changes occur in the epidermis while others are of the opinion that the corium is the first involved; a discovery of the exact etiology would probably do much to straighten out these details. The chief changes noticed in the epidermis are hyper-keratosis and parakeratosis in the stratum corneum, thinned or absent stratum granulosum, and acanthosis in the rete. In the early lesions the scales are convex and thickest in the center, contain air spaces, and are arranged in layers. Migratory leucocytes are found which frequently collect usually between the stratum corneum and the rete to form microscopic abscesses (Munro). The rete pegs are elongated and thickened and a moderate amount of intracellular edema is present. The portion of the rete immediately overlying the papillae is not thickened, and usually is thinner than normal, this accounting for the ease with which bleeding occurs in early lesions when the scale is removed.

The leucocytic infiltration of the epidermis varies with the intensity of the process, being most marked in the pustular forms.

In the corium, vascular dilatation with swelling of the endothelial lining of the vessels occurs, and perivascular cellular infiltration consisting of lymphocytic and polymorphonuclear leucocytes and fibroblasts. The papillae are elongated, broadened and at times clubbed, filling^{the}/interspaces of the rete pegs. The collagen is edematous but the elastin is not affected. In verrucose psoriasis there occur hyper-keratosis, cornification of the upper portion of the rete, and excessively elongated rete pegs and papillae. (Ormsby, 32).

The histopathology of pustular psoriasis according to Barber (2) is identical to that of acrodermatitis continua, which consists of a long narrow papillary processes extending in places almost to the stratum corneum, but with

supra-papillary subcorneal micro-or macro-~~ab~~cesses, consisting chiefly of polymorphonuclear leucocytes and "balloon cell" formation in and about and especially beneath the abscesses. Pustular psoriasis differs mainly in that the early cellular infiltration as in ordinary psoriasis is mainly lymphocytes, the Polymorphonuclear leucocytes tending to make their appearance later; also that the resistant framework of acro dermatitis continua is less evident and the "balloon cell" formation occurs hardly at all.

TREATMENT

The treatment of psoriasis, as its etiology, is mainly an unknown quantity, as has been hinted before. The mere multiplicity of the remedies stand as evidence of their inefficiency. The lesion, can, however, usually be removed temporarily, but they commonly return and the disease is exceedingly resistant to treatment. The lesions may disappear spontaneously, but recurrences are almost certain and there is a tendency for the attacks to become progressively worse and for each remedy gradually to lose its effectiveness. Any method however ordinarily takes a long time because the involution under treatment is practically always slow and each method should have an adequate and thorough trial. Every patient should and must be told that they have a chronic disease which we can be reasonably sure that we can palliate but we should never promise a cure of the disease.

Treatment in general may be divided into (a) general, (b) internal, and (c) local therapy. Local applications may be tried first but it is, in general, preferable to combine all three to actually rest assured that all possible beneficial therapy is being exerted.

The general treatment consists mainly in ascertaining the general condition of each patient and recognizing and treating any systemic disturbance. In case nothing abnormal is found local treatment should be employed, as has been stated, for a reasonable time before resorting to arsenic or other drugs that may be irritative or actually dangerous. Diet in psoriasis has been carefully studied and in properly selected cases it is probably of value to institute a low protein regime. Schamberg has found a low-protein diet valuable in removing the lesions or perhaps rendering them more susceptible to removal by local applications. He and his co-workers found a definite nitrogen retention or positive balance in most psoriatics that they examined. (42) He reasons that in psoriasis there is a rapid proliferation and exfoliation of

epidermal cells, and that for this growth these cells require building material which can be obtained only from one source--the blood and lymph streams. The principal building material required by these cells is protein. It is at once evident that since these cells are endowed with a powerful "growth impulse" the velocity of their growth will be proportionate to the amount of building material in the form of protein at their disposal. We may conclude from this line of reasoning that any increase in the amount of protein consumed would aggravate the condition, but conversely, that any diminution could be beneficial. Schamberg recommends the elimination of meat, fish, fowl, soups with meat stocks, eggs, and internal organs from the dietary. This is disputed naturally many authorities who have found no nitrogen retention in psoriasis and as pointed out by Pollitzer (35) the Europeans seem to have about as much success with their treatment, neglecting diet entirely as we do stressing it as we do.

Bulkley (7), Greenbaum (18) and Levin and Silvas (26) essentially agree with Schamberg. Bulkley insists that a purely vegetarian diet has given him spectacular results; Grubb believes butter curative, and Levin and Silvas believe a salt free diet of definite benefit.

The local treatment is one to be most emphasized. In acute spreading eruptions, local applications should be soothing. The successful operation of various medical substances employed requires the removal of the scales, which may be accomplished by applying oil, glycerine, or vaseline, after which the scales may be washed off with soap and water. The soothing lotion used for the acute spreading eruption are varied; olive oil, calamine lotion, cold cream, toilet lanolins, soft zinc oxide paste, or a weak ammoniated mercury may be used. As the acute inflammation subsides, stronger applications may be tolerated; but one should always be cautious in order to avoid irritation. Ointments are usually more beneficial than lotions or paints. At this stage the ointments may contain five per cent ammoniated mercury, two per cent yellow oxide of mercury,

or three per cent salicylic acid. For quiescent or chronic patches one may prescribe ointment composed of ammoniated mercury 10-50 per cent; salicylic acid 5- 30 per cent; oil of cad 5-50 per cent; chrysarobin 1-10 per cent of pyrogallie acid 2-10 per cent. Inveterate patches may be painted with chrysarobin solution 5-20 per cent in chloroform, or in traumaticin.

The preparation that seems of most value in local treatment seems to be chrysarobin in the above stated strength. It commonly produces a dermatitis which subsides within a few days. The plan followed by Ormsby (32) is to have chrysarobin applied daily until a slight erythema is detected at the edge of the brownish discoloration produced by the application. Its use is then suspended until the reaction has subsided. As a rule when the applications may be repeated on five successive days, though in some one treatment causes a reaction and in others ten may fail to do so. When the areas are numerous or in large areas, chrysarobin is best used in the form of a soft ointment well rubbed into the patches daily. The surplus ointment may be wiped off and the skin covered with a dusting powder. For circumscribed areas chrysarobin may be used in collodion or traumaticin, and applied with a brush or a swab and allowed to dry. This application may be removed daily as above suggested. There is some danger of absorption from too liberal application of chrysarobin as well as mercury and pyrogallol on extensive areas so this should be carefully watched to renal irritation. Chrysarobin is also irritative to the eyes and patients must be wared of this. It also stains severely and is quite destructive to clothing, and hence new combinations have been sought. Novorobin was introduced by Schamberg and dioxy-anthronal by H. Haldin-Daiv (26) and seem to avoid these objections in large part. Fox (12) states the use of auto serum injections enhances the effect of chrysarobin and Ormsby agrees. Mook (31) recommends 2 per cent phenol in ointment if the patient is hospitalized and under close supervision. If used along with x-ray or radium treatment, moderation should always be exercised in local remedies, there being an inverse

ratio between the two.

The tars probably rank next to chrysarbin in the treatment of psoriasis. Owing to their ability to produce undue reactions in susceptible skin it is well to employ them first on a relatively small portion of the affected surface. It is also necessary to leave the preparation on for several hours as the tars do not produce prompt reactions. Pix liquida, oleum cadinum, or oleum Rusci may be used in the form of a salve, 1 dram of either to the ounce of lard, lanolin or petrolatum or a combination of these. A thin layer of this ointment should be well rubbed into the patches which have been denuded of their scales twice daily. In European clinics, tar is applied after a soft soap bath and the patient is returned to the bath, where he remains for several hours. Green soap, salicylic acid, and sulphur are sometimes combined with tar.

When applied over the general surface absorption of the two may take place with the production of general toxic symptoms, which include fever, vomiting, diarrhea, strangury, or the elimination of the toxic agent, in secretions which are blackened by its presence. The symptoms are usually relieved in from twenty-four to forty-eight hours after the discontinuance of the drug.

Tar has been reported to be more effective or perhaps to enhance the efficiency of x-ray and ultra-violet light therapy. Goeckerman (16) reports that he can always benefit psoriasis with tar and ultra-violet combined, but of course he does not state he can permanently cure the disease or markedly hinder its course.

Many other substances have been used with varying results. Salicylic acid, ammoniated mercury, sulphur, resorcin have been used especially at times when chrysarbin or the tars are contraindicated, such as the scalp regions, where 10 per cent ammoniated mercury or mild chloride of mercury or a 3-5 per cent salicylic acid ointment is recommended. Occasionally sulphur or resorcin may be substituted especially when the use of a salicylic acid ointment for a few days in connection with alkaline baths is valuable as a preliminary measure before beginning chrysarbin.

many

There have been a great/preparations developed and suggested for internal treatment of the disease. Of these many internal agents, arsenic has been used most extensively. In some cases the prolonged administration of this drug gives temporary or even permanent relief it seems. On the other hand, a large number are not benefited and in some cases untoward results occur (16). In view of these facts it is best to employ arsenic as the last resort, rather than to suggest its use in the beginning. It is contraindicated in all cases of the disease occurring with acute symptoms, or when the disease is actively progressing. This remedy should be reserved for cases which have resisted other methods of treatment and which are stationary. In order to get good results the method of administration is important. Arsenic should be given in small doses, well diluted with water and gradually increased. In case toxic symptoms occur the dosage should be reduced until they have cleared up. The effect of the drug is not seen immediately and it is therefore necessary to continue its use for from several weeks to three months.

The preparation commonly used internally is Fowler's solution, which should be commenced in doses of from $\frac{1}{2}$ to 3 minims and gradually increased until 10-15 minims are being taken three times a day. A solution of sodium arsenate is suggested by Stelwagon (45) in cases of weak digestion. Other preparations are arsenic trioxide in pill or table form, or in the form of the Asiatic pill. The latter compound is sometimes of value when other preparations have failed.

Sodium cacodylate may be administered per mouth in doses of - to 3 grains three times a day or by subcutaneous or intramuscular injections, which is the method of choice today, in a dosage varying from 1 to 10 grains.

Arsphenamine has been used to a moderate degree in the treatment of psoriasis, also with varying effects. Pollitzer (35) observed no effect in a psoriatic who received arsphenamine for syphilis. Ormsby (32) has had several luetic psoriatics, none of whom responded to the arsphenamine other than a

decrease in luetic manifestation. Robertsen (40) reports twelve cases who cleared up entirely under a neosalvarsan regime and that there have been no recurrence for a year. He did use ultra-violet light, chrysarobin, ammoniated mercury, or zinc oxide on some of them also but states that previous to the neosalvarisan none of these agents helped. Winfield (55) likewise reported favorable results in some. Greenbaum (18) also believes arsenic to be helpful; he states sodium cacodylate in large doses or salicylates especially salicin may be beneficial also. MacKenna (27) on the other hand again believes them of no value. He has been quite an experimenter in this field. He has tried emetine, autohemo therapy, and vaccines which have been sadly disappointing though with vaccines of staphylococci and typhoid he perceived relief in four of sixteen cases. He tried the so-called "fixation abcess," and injection of terpichin (terpentine, quinine plus some anesthetic) intra-gluteally and seemed to help some; but he states in plain fash that x-ray and ultra-violet along with tar or chrysarobin were the best relievers. Salicin has been quite helpful in his hands.

There have been a variety of other miscellaneous treatment offered, none of which seem to have definite proof of value. Crocker (10) advised the use of sodium salicylate or salicin. Pernet (34) believes that perseverance with salicin will also accomplish the desired result. Potassium iodid and mercurous iodid have been reported beneficial. Thyroid extract and pituitary substance are occasionally of value.

A type of gold therapy has been recently developed. Tooney (48) used collidal gold and reported that it cured all cases so treated and that it was not too expensive and that when given by mouth it gave few unpleasant complications. Mann & Boulsaid (29) used crysalbine, a compound with 37% gold given in aqueous solution intravenously weekly, but they concluded that gold had a very limited effect on the disease and that it was very dangerous to be using.

Chrysarobin has been given by Heavey (22) orally and he states that 30 drops per day in water is a definite aid in the seborrheic type of acute psoriasis and may even be a cure. Magill (28) got apparent cures from mercurochrome in two months. He used a system of three injections intravenously, the first being 10 cc of one per cent solution, the second 20 cc and the third 30 cc. Sweltzer (27) used intravenous acriflavin similarly and reported in a series of 20 cases 17 improvements, four of which were quite striking. He thought perhaps the result came from photosensitization to a great extent. McCarty has used a substance known as ectbrom which is a four per cent sugar solution containing ten per cent sodium bromide. He stated that when given in 10 cc doses intravenously every 3-4 doses for sixteen injections that he got complete relief for nine to thirteen months while under observation.

As in the periment to transmit or autoinoculate this disease, there have been attempts to reach a therapeutic end via this also. Campbell and Forst (9) used intramuscular injections of a suspension of the patient's own finely ground scales in alcohol made the emulsion to consist of approximately 0.2 gms. scales 20 cc of pur alcohol and gave from one to four cc every three or four days. All patients responded favorably in varying degrees and there were no untoward reactions. Wrong (56) also tried this method with some changes and reported four cases unimproved, five improved, and one cleared entirely of his lesions, so it would seem to have possibilities. Nevertheless it seems that our main reliances are upon local treatment, systematic treatment seeming dubious and dangerous and general treatment generally believed to be of very little if any value.

Recently actinotherapy has become a subject of quite prominent note in most of the chronic dermatological diseases. This includes almost all types of radiation, from sunlight to radium. It is often stated that the increased activity of the sun's rays causes the apparently better status of psoriasis in summer months, and often seeming cures come from sunlight alone. Various substances

applied locally and systemically seem to enhance the powers of these rays. Hanthausen (21) reports a case which he treated by intravenous tryptaflavin and who for along time afterward could not expose herself to strong light because of an extreme edema of the hands and face which occurred promptly after such exposure. Tar and chrysarobin have been reported to do^a/more or less sensitization process. Zakon (57) reports that tryptaflavin, which is a derivative of acridine, a base of coal tar, sensitized the skin to quartz light, and influences pigment metabolism; he reports the vast majority of his cases cured or improved by such combined treatment.

In any event actinotherapy has definitely been proven of aid and since it is most frequently used in cases of long standing or in cases that have resisted other treatment, it would seem that it deserves all the credit it can obtain. Haldin-Davis (20) believes any active hyperpyrexia will accomplish the result but so far as is known x-ray, ultraviolet, and direct sunlight are quite the most appropriate. Rash has carried out numerous experiments on this line and he states it as being practically certain relief of 46 cases that he treated, all were remarkably aided and he got no recurrences in from one to four years. It seems that this is the modern trend for psoriatic therpeusis, but much remains yet to be done and discovered about it. The next few years will probably be much more revealing than the past few, if the present trend maintains itself; but until sometime in the future is is most popularly felt that we cannot be sure of specific therapeusis.

CONCLUSION

Psoriasis is one of the more common dermatological diseases and with on/which we are as yet rather inadequately able to cope. It has been recorded from early ancient times and has been quite confusing to this day. There have been numerous factors accredited as the cause of this disease but the more common ones included heredity, lowered resistance, metabolic disturbances, dietetic indiscrepancies, parasitism, and a neurogenic basis. The one being most popular at present seems to be the parasitic theory. Psoriasis in its symptomatology is an essentially chronic inflammatory disease characterized by dry, reddish, rounded or oval patches, which are covered with whitish, silvery, imbricated scales, and exhibit a predilection for extension surfaces. Its pathology is essentially a hyperkeratosis and parakeratosis in the stratum corneum and acanthosis in the rete with so-called (psoriatic abscess" formation.

Treatment is at best rather inadequate but temporary attacks can almost always be relieved but cannot be kept from recurring. Chrysarobin and tar seem to be the most effective local applicants, and arsenic internally often seems of definite benefit though dangerous. Radiation in almost any form to cause a local hyperpyrexia, such as x-ray, ultra violet light, et., seem quite beneficial.

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