CRYOTHERAPY FOR ROSACEA

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The treatment of the patient with rosacea is of much greater importance than is treatment of the skin. Nevertheless topical measures are very helpful and cryotherapy is a particularly useful ancillary method.

History of Cryotherapy

Treatment by cold (cryotherapy) has been practised in medicine for many centuries. The use of liquid air to produce intense cold locally by White in 1899 introduced a new and valuable method of treatment into dermatology. His technique was soon adopted successfully by other American practitioners such as Trimble (1905), Whitehouse (1907), and Dade (1908); liquid air was used also in Australia by Beckett (1905). In 1900 Dethlefsen reported his method of local freezing of skin lesions with ethyl chloride. Saalfeld (1901) found liquid air too expensive. He considered using liquid carbon dioxide but decided on methyl chloride 15 per cent. in ethyl chloride. Liquid carbon dioxide was used by Arning (1903). Juliusberg (1905) tried ethyl chloride and then developed a technique of spraying with liquid carbon dioxide. He excised pieces of skin which had been sprayed and studied them histologically.

The next great advance came from Pusey (1907 a and b) who introduced solid carbon dioxide ('snow') as the freezing agent. From this time onwards liquid air was gradually given up and snow became the standard substance for local cryotherapy. Pusey's work was soon copied and extended by Hubbard (1908), Jackson and Hubbard (1909), Sutton (1909), Zeisler (1909), and many others in America, by Lawrence (1909) in Australia, and by Morton (1910 a and b) and Stopford-Taylor and MacKenna (1912) in England. Between 1910 and 1913 Pusey's method spread to most civilized countries and a number of French theses for doctorates appeared on the subject. In 1911 Cranston Low published an excellent monograph on the subject with 94 references and another smaller monograph by Hall-Edwards appeared in 1913. About this time a large number of 'cryocauteries' were devised and described. From then onwards the majority of articles on cryotherapy came from France.

Sibley (1912) dissolved the snow in ether.

Beclere (1913) used acetone as a solvent; the resulting 'carbon-dioxide-acetone-slush' is an extremely valuable agent. Its use was popularized and studied by Giraudeau (1928), Thibaut (1928) and Lortat-Jacob and Solente (1931). Good reviews have been written by Lortat-Jacob and Solente (1930) and by Solente (1936); the former has a very long but rather inaccurate bibliography.

Effects of Cryotherapy on the Skin

The effects of cryotherapy were studied by Solente (1925). On freezing, the skin becomes white and hard. It takes about three times as long to thaw as to freeze. After thawing the skin becomes congested. Later a vesicle or bulla forms and this may be followed by a crust which eventually falls off leaving pink skin. With shorter applications of the snow there is erythema but no vesicle. The greatest local vascular congestion is produced by repeated very short applications but the degree of the reaction varies greatly in different people. When brief applications are used there is vasoconstriction for a moment followed by vasodilatation which lasts some hours; finally there is lasting vasoconstriction. According to Bachelin (1926) some of the vessels become obliterated. Histologically brief freezing results in oedema and infiltration in the dermis (Lortat-Jacob and Solente, 1930).

The dosage must be considered in terms of time and pressure. The French use a special apparatus called a cryocautery and prescribe a definite measured pressure as well as the length of time of application. The effect of pressure is more important with a snow stick than with slush though rubbing with the slush enhances its effect (Lortat-Jacob and Solente, 1931). Freezing is very much more rapid with slush than with the stick. Beclere (1913) says that the former is not colder but that the stick is surrounded by a thin zone of carbon dioxide gas which protects the skin. Rapid evaporation of the acetone may also play a part.

Children are much more sensitive than adults and women react more strongly than men. Some areas of skin are more sensitive than others (Bachelin, 1926, Lortat-Jacob and Solente, 1930). According to Lortat-Jacob and Solente (1930)

previous freezing diminishes sensitivity to further freezing, but previous radiotherapy increases it. They believe that local freezing can have a general effect via the nervous system.

The Preparation of Carbon-dioxide-acetone-slush

In hospital practice the source of carbon dioxide is a cylinder of the gas. This must be inverted and a chamois leather bag is tied tightly on to the nozzle. The cylinder is turned on and the carbon dioxide escapes into the airtight bag; the pressure in the bag rises rapidly and firm snow is formed. In private practice, and wherever this form of treatment is likely to be rather infrequent, the snow is most easily prepared in the 'Sparklet' apparatus which is made for this purpose. In either case it is most important that the cylinder should be inverted for use because it is from the liquid (not directly from the gas) that the solid is made.

The snow is broken into small pieces and put into any clean dry vessel. Acetone is then dropped on to it from a pipette until the mass just becomes translucent. When the right amount is used the slush looks like a colourless water ice. It must then be used immediately as it evaporates rapidly.

The Nature of Rosacea

Rosacea is a disorder primarily affecting the blood-vessels of the dermis. It is sometimes mis-called 'acne rosacea' but the acnes are essentially disorders affecting the epidermis. As Cheadle (1874) said, 'The name acne rosacea is a misleading one. The disease is not *acne* in the true sense at all.'

Stokes (1942) describes rosacea as a 'vasomotor neurosis.' In its complex aetiology the psychogenic factor is of the greatest importance. Stokes and Beerman (1932) suggest that this factor acts through the gastro-intestinal tract indirectly liberating vasodilator substances. The psychopathology has been studied by Klaber and Wittkower (1939). They showed that there was nearly always social anxiety with feelings of inferiority, guilt, or shame. Sometimes there were prolonged social stresses or acute psychological trauma immediately preceding the onset of the dermatosis. Ingram (1948) regards rosacea as a 'variant of blushing,' and, as Campbell (1890) wrote, 'A blush *always* arises from emotion.' Crookshank (1930) put it more strikingly, 'So too, does the fleeting blush of maidenly modesty, if too carelessly evoked, pass into rosaceous grogg-blossoms at the climacteric.'

Rosacea may begin at any time between puberty and old age though it is commonest between the ages of thirty and fifty. Women are affected much

more frequently than men, and spinster school-teachers are reputed to be the greatest sufferers. The patients are often seborrhoeic but are rarely affected severely.

Treatment of Rosacea

General treatment is as important as local. Psychotherapy is the logical approach to a psychogenic disorder. Nevertheless other factors must not be ignored and treatment of the skin itself plays a useful part.

Giving dilute hydrochloric acid with the meals helps many (but by no means all) patients irrespective of the level of their gastric acidity. Despite the evil reputation of alcohol in this disorder, tea, especially when long brewed, is a much more noxious drink. Pepper, spices, pickles, and hot highly seasoned soups are best avoided, as also is chocolate when there is much seborrhoea. At the menopause oestrogens are sometimes helpful (Gross, 1944).

Obvious septic foci should be treated. Brown, Smith, and McLachlan (1935) found evidence of focal sepsis in 51 per cent. of 200 patients with rosacea and Frit, Laszlo, and Vero (1935) regard the papular and pustular elements as a 'bacterid from focal infection.' It seems probable that these views are exaggerations.

A mild sulphur lotion, such as sulphur 3 per cent. in lacto-calamine, should be applied at night except in very fair skinned people who should use a weak, stiff, ichthammol paste.

In addition some form of physical treatment is usually needed. Anderson (1946) strongly recommends U.V.R. and Stokes (1942) finds it useful but Haldin-Davis (1930) warns that it may make the patient worse. Fractional treatment with superficial X-rays is widely recommended but the doses must be small (Haldin-Davis, 1930, Stokes and Beerman, 1932, Sequeira, Ingram, and Brain, 1947, Ingram, 1948).

The value and action of Cryotherapy in Rosacea

Despite the fact that cold may be an aetiological factor in rosacea (Haxthausen, 1930, Lortat-Jacob and Solente, 1930, Sequeira, Ingram, and Brain, 1947), cryotherapy is the most valuable ancillary method of treatment. It seems that the use of snow for rosacea was first mentioned by English dermatologists. Cranston Low (1911) used it on one patient and he was followed by Morris (1912), Stopford-Taylor and MacKenna (1912) and Davis (1913). In Denmark, Haslund (1913) obtained excellent cosmetic results and stressed that pressure with the stick must be very slight. Slush was used for rosacea in France by Jeanselme and Giraudeau (1924) and Bachelin

(1926); other French workers advising cryotherapy for this dermatosis were Solente (1925, 1936), Acquaviva (1930), and Lortat-Jacob and Solente (1930). On the other hand, Stein (1932) found the cosmetic results unsatisfactory; he found applications of slush for 2-3 seconds the best way of freezing. During the past fifteen years little has been written on this form of treatment though there have been occasional recommendations for its use in rosacea from Scotland (Kinnear, 1947), U.S.A. (Way, 1939), Canada (Marin, 1939), Latin America (Vieira, 1947, Fernandez Blanco, 1948), and France (Desaux, 1948). In U.S.A., Bluefarb (1945) and Hume (1948) recommended that powdered sulphur should be mixed with the slush.

Solente (1925) pointed out that its value in rosacea was due to the ultimate diminution in calibre of the local blood-vessels in the dermis. This is the accepted mechanism of its action but Lortat-Jacob and Solente (1930) claim that there is an additional reflex action via the sympathetic. Some workers, such as Vieira (1947) use the snow only to destroy the small, easily visible, dilated, superficial vessels. This is the only purpose for which a snow stick may be better than slush.

The technique and results of Cryotherapy in Rosacea

There are three ways of applying the slush to the face. A cryocautery may be used. This has the advantages of ease of use and accuracy in giving the required amount of pressure (which should be the minimal in rosacea except for much thickened lesions); neither of these is great. The disadvantage is that a special and unnecessary piece of apparatus must be bought or made.

Way (1939) rolls the slush into a 'snow ball' held in a piece of gauze, the operator's hand being protected with chamois leather. The third way is to wind three turns of cotton bandage round one end of a wooden spatula and then to use it as an applicator.

The slush is brushed over the affected areas with very slight pressure twice. It stays in contact with the skin for one to three seconds. Jeanselme and Giraudeau (1924) stress the importance of friction with slush. Only practice can teach just how rapid and how heavy the movement should be. In old people and in those with thin skins, it should be light and rapid. Younger people, especially when dark and seborrhoic, benefit from a heavier slower hand. On the thicker areas the skin should go white momentarily from freezing; on thin skin it is usually unnecessary to reach this stage except on the nose. A towel should always be put round the patient's neck during treatment because pieces of the slush are apt to

fall off and drop inside the clothes where they cause blisters on the chest before they can be removed. Treatment is usually given once weekly but the interval must be longer if any reaction from the previous treatment remains.

Shortly after treatment the skin becomes bright red and remains unsightly for a few hours. This is accompanied by a mild feeling of burning (the actual application of the slush is more painful), which may be relieved by fuller's earth, talcum, or face powder. By next day all sign of the immediate effects of treatment should have gone but there may be some blistering especially after the first treatment when the sensitivity of the skin is not known. There is less likelihood of blistering after subsequent applications. The total length of treatment is variable and must be judged separately for each patient; four to eight sessions are usual.

The treatment nearly always leads gradually to much improvement. Each week the skin can be seen to be paler with fewer obvious dilated vessels and less thickening. Complete cure is less common. It is essential to remember that cryotherapy is only a part of the treatment.

Summary

1. The history of cryotherapy has been reviewed briefly.
2. It causes vasodilatation locally followed by vasoconstriction with the obliteration of some of the superficial vessels.
3. Rosacea is a disorder of complex aetiology affecting the blood-vessels of the skin and occurring principally (but not exclusively) in women between the ages of thirty and fifty.
4. The psychogenic factor is particularly important in rosacea whose pathogenesis is related to that of blushing.
5. General and local treatment must be used in rosacea.
6. The technique of the preparation and use of carbon-dioxide-acetone-slush is described. It is of great value in treating rosacea.

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Possibly the earliest mention of a breast tumour occurs in Herodotus (Book III, Section 133), wherein Atossa, daughter of Cyrus and wife of Darius, King of the Persians, is stated to have suffered from such a tumour. Like many subsequent members of her sex, whilst it was small she concealed it and from delicacy informed no one of it. After some time it burst and spread considerably. She thereupon called in Democedes, a Greek, who fortunately was able to cure her.

Some chapter later (Section 149) it is stated that the Persian general, Otanes, having captured Samos, delivered it utterly devoid of inhabitants to Syloson. Afterwards, however, Otanes repeopled it in consequence of a vision in a dream, and a distemper which seized him in his private parts.

It would appear possible that Columbus was not responsible for all that is attributed to him.