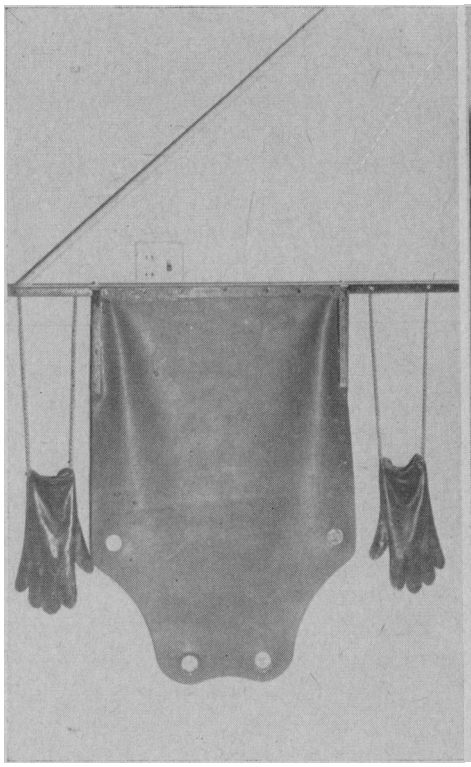

Fig. 1

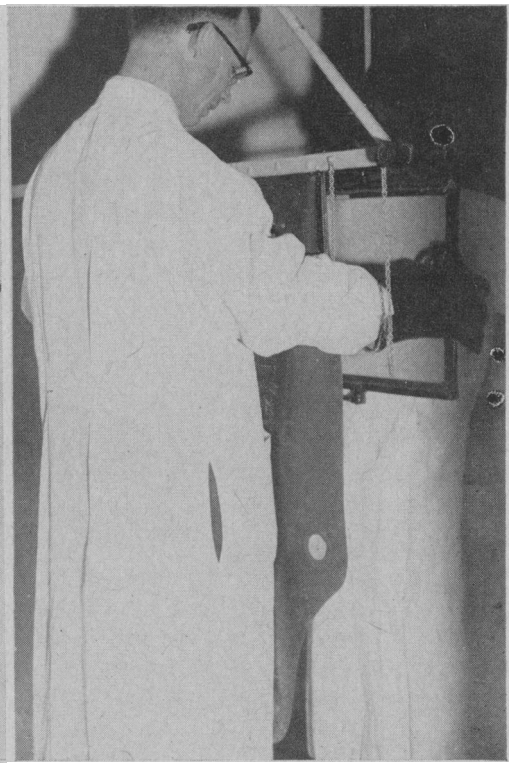

Fig. 2

to the cross-bar. A lead-rubber apron is then riveted upside-down to the cross-bar, in such a position that, when the triangle is swung forward, the apron hangs directly in front of the fluoroscopic screen. The height at which the triangle is bolted to the wall, is such that for a physician of average stature, the apron protects him from just below the shoulders to well below the knees. A pair of fine but strong chains is then riveted to each glove, and then to the cross-bar on each side of the apron (Fig. 1). These chains are of such length that one's hands can be thrust into the gloves without difficulty, the gloves are hung palms outward with the thumbs directed medially.

When one is prepared to carry out a fluoroscopic examination, it is only necessary to swing the triangle forward in front of the fluoroscopic screen, insert one's hands into the gloves, and proceed with the examination (Fig. 2). The gloves are of such a weight that they will fall from the fluoroscopist's hands when he raises them after completing the examination, and it is unnecessary to use the other hand to remove the glove from either hand.

Having used this device over a period of almost two years, we have found that it has certain advantages: (1) It apparently provides the same amount of protection to the fluoroscopist as provided by the apron and gloves used in the conventional manner. (2) No time is wasted by the operator in donning and removing apron and gloves during a refill clinic. (3) It is so simple and convenient that there is no temptation to disregard the protection that it provides.

It is possible that radiologists, other than those working in tuberculosis hospitals, may wish to avail themselves of the protection provided by this device.

THE CUTANEOUS APPLICATION OF A NICOTINIC ACID CREAM AS A DIAGNOSTIC AID IN VARIOUS RHEUMATIC DISEASES*

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RECOGNITION of typical cases of rheumatoid arthritis presents little difficulty. In the early stages of the disease, however, or when the process is atypical the diagnosis can often be extremely difficult to establish and the clinician

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has to be satisfied with a probable or tentative diagnosis. Not infrequently, a six-month observation period is necessary before rheumatoid arthritis can be identified with some degree of certainty.

Although the diagnosis of rheumatoid arthritis rests primarily on an adequate evaluation of symptoms and signs, radiography and laboratory procedures are helpful in establishing the nature of the disease.

The erythrocyte sedimentation rate and a complete blood count are probably the most valuable laboratory aids in the diagnosis of rheumatoid arthritis. Two other procedures, the streptococcus agglutination test and the sensitized sheep cell agglutination test are also considered helpful in some 60% of cases of the disease. The combined results of all these laboratory procedures more than the evaluation of any of these tests taken separately may help in establishing the rheumatoid nature of an arthropathy.

In an effort directed at finding more diagnostic aids, we studied the application of an interesting observation made by Nassim and Banner[2] and also by Oka.[3] These investigators reported in patients suffering from rheumatoid arthritis the absence of the usual local hyperæmic reaction observed following the topical application of a 5% water-miscible cream containing the tetrahydrofurfuryl ester of nicotinic acid.* A similar phenomenon was reported by Streitfeld and Saslaw[4] in a small series of patients suffering from rheumatic fever. The above preparation has been used in Europe[1] and more recently in our clinic as an effective rubefacient.

Materials and methods.—To perform the test, the examiner gently rubs with his finger 80 mgm. of the nicotinic acid cream into a cutaneous zone of approximately one and a half inches diameter on the volar aspect of the left forearm. A lanolin-vaseline ointment used as an inert vehicle for the nicotinic acid preparation† was applied in the same manner on the corresponding area of the right arm and was used for control purposes. In all instances, the test and control areas were observed for hyperæmia and œdema by the same investigator, who was completely unaware of the probable diagnosis.

The skin response to the test cream was thus graded:

−: No visible alteration of the skin or very slight erythema fading out within five to ten minutes.
±: Questionable hyperæmia and/or local œdema.
+: Hyperæmia with or without œdema, associated with a sensation of warmth and tingling at the site of application.

In our experience the topical application of the nicotinic acid cream may occasionally induce delayed cutaneous reactions occurring from four to 12 hours following the application of the preparation. Since all those who reacted to the application of the test cream did so within 10 to 15 minutes, we decided to consider negative the erythematous reactions occurring following an observation period of at least one hour.

We observed that the normal response to the cutaneous application of the nicotinic acid cream is more rapid and more intense if the subject is young, if the skin is warm and if the person is of light complexion.

Skin testing with the tetrahydrofurfuryl ester of nicotinic acid was performed on 163 subjects; 72 apparently healthy members of both our resident and nursing staffs served as controls. Of the 91 patients tested, 57 suffered from rheumatoid arthritis, five from rheumatoid spondylitis, four from rheumatic fever, two from disseminated lupus erythematosus, 10 from osteoarthritis, and 13 from undiagnosed arthropathies.

TABLE I.

SKIN REACTIONS TO THE TOPICAL APPLICATION OF THE TETRAHYDROFURFURYL ESTER OF NICOTINIC ACID IN RHEUMATIC DISEASES AND IN CONTROLS.

Diseases	*Number of cases*	*Responses* +	±	—
Rheumatoid arthritis	57	4*	2	51
Rheumatoid spondylitis	5	3	0	2
Rheumatic fever	4	0	0	4
Undiagnosed arthropathies	13	10	0	3
Disseminated lupus erythematosus	2	1*	0	1
Osteoarthritis	10	10	0	0
Controls	72	69	2	1
Total	163			

*Patients treated with either cortisone or corticotropin

Results.—In all instances the application of the control ointment to the right forearm failed to induce any cutaneous reaction. Our results are otherwise tabulated in the accompanying table.

All the controls but three presented within five to 10 minutes local hyperæmic reactions with or without œdema after cutaneous application of the nicotinic acid cream. One member of this group failed to react although some tingling and

*Manufactured by Ciba Co. Ltd. (Montreal) under the trade name "Trafuril" and generously supplied through the courtesy of Dr. Fred Wrigley, Medical Director.
†Ciba's "Ointment 'B'".

warmth but questionable hyperæmia were observed. The 10 patients suffering from osteoarthritis reacted like the controls to the cutaneous application of the cream.

Of the 57 rheumatoid arthritis patients, only six responded to the local application of the nicotinic acid cream. Four patients from this group were receiving either cortisone or corticotropin at the time of testing. The two other patients were treated with phenylbutazone.* In rheumatoid spondylitis the results were much less predictable: we observed three positive and two negative reactions.

Only four patients suffering from active rheumatic fever were skin-tested; all of them failed to react to the topical application of the nicotinic acid cream. This is in agreement with the observation previously mentioned.[4]

Of the two disseminated lupus erythematosus patients tested, one did not respond but the other, receiving huge doses of cortisone, reacted normally to the skin test.

Finally, in three of 13 patients suffering from undiagnosed arthropathies, the nicotinic acid cream did not induce a local hyperæmia. Considering the frequent atypical manifestations of rheumatoid arthritis, such a diagnosis in the nonreactors of this group remains a distinct possibility.

Discussion

We are not prepared to offer any explanation concerning the mechanism of the phenomenon observed. It is however interesting to note that cortisone, corticotropin and possibly phenylbutazone seem capable of modifying the reaction.

The present series is obviously too small to justify any conclusions regarding the value of the skin test in rheumatic diseases. Our data as well as reports from elsewhere[2, 3, 4] suggest that patients suffering from certain rheumatic diseases might react differently to the cutaneous application of the tetrahydrofurfuryl ester of nicotinic acid according to the variety of arthropathy involved. Since this chemical compound seems more or less inert in patients with active rheumatic fever or rheumatoid arthritis and almost consistently induces a strong hyperæmic response in normal individuals and in certain arthropathies, the nicotinic acid cream might prove to be helpful as a diagnostic aid in rheumatic diseases.

*"Butazolidin"—Geigy Pharmaceuticals, Montreal.

Summary

The cutaneous application of a cream containing 5% of the tetrahydrofurfuryl ester of nicotinic acid to 163 subjects induced a marked localized hyperæmic reaction in all but one apparently healthy individual serving as controls, and in all patients suffering from osteoarthritis. In those with active rheumatoid arthritis and in rheumatic fever, the drug failed to produce any cutaneous reactions except when either cortisone or corticotropin was being therapeutically administered; two rheumatoid arthritis patients receiving phenylbutazone also failed to respond to the cream. The reaction appeared unreliable in rheumatoid spondylitis. One patient suffering from disseminated lupus erythematosus and receiving cortisone responded normally to the local application of the cream; an untreated case of the same disease did not react when skin-tested.

The mechanism of this phenomenon and further observations regarding the value of the nicotinic acid cream as a diagnostic agent in rheumatic diseases are being investigated.

The helpful assistance of Miss Jeannine Leblanc, R.N. is gratefully acknowledged.

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ETHYLENE GLYCOL POISONING

In contrast to the two cases of ethylene glycol poisoning in children recently reported in this journal (Nadeau, G., Cote, R. and Delaney, F. J., *Canad. M. A. J.*, **70**: 69, 1954), four cases reported from Northern Italy all occurred in persons who should have reached years of discretion. The four men concerned, aged from 56 to 70 and described as heavy eaters and drinkers, were ill advised enough to take from 100 to 1,000 c.c. of ethylene glycol as a beverage. The results were manifested in three stages: an initial one of drunkenness and euphoria; a second of confusion, inability to walk and vesical sphincter disturbances; and a third of deepening coma from which three men never recovered. The final stage was accompanied by signs of severe renal damage, with oxalates and erythrocytes in the urine.

It would seem that the three stages may correspond to one of alcoholic intoxication, one of mixed alcoholic and oxalic intoxication, and one of oxalic acid poisoning alone. The severity of the condition is directly proportional to the quantity drunk, with a minimum lethal dose of over 100 c.c.

Chemically, the likelihood is that the syndrome will be confused with ethyl alcohol intoxication, but the whole picture is more severe and of more rapid development in ethylene glycol poisoning.—I. Morini, *Minerva Med.*, **45**: 72, 1954.