and Rh types. The results confirm the conclusion previously arrived at that, in respect of the blood antigens, the South African Bantu is genetically a distinct and homogeneous race.

Elsdon-Dew's data of the ABO distribution in various Bantu tribes have been re-examined and his claim to have demonstrated definite variations on a tribal basis found to be statistically untenable.

References


BEE STING SENSITIVITY AND DESENSITIZATION WITH BEE BODY EXTRACT
BY THE INTRACUTANEOUS ROUTE

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The occurrence of serious reactions, including angioneurotic oedema and collapse, to the sting of the honey bee (Apis mellifica) is not uncommon in South Africa and frequently brings with it an urgent demand from doctor and patient for protection against the effects of future bee stings. It is curious that such protection is usually not sought after less severe clinical manifestations such as pain and swelling in the parts stung, although most patients have learned from experience that each subsequent sting produces more sinister reactions.

Some 15 years ago, in studying bee venom sensitivity in a medical colleague in these laboratories, it was found that skin reactions to the extract made from the sting and poison sac were identical with those from an extract of the bee body minus the terminal portion of the abdomen of the insect carrying the sting and sac. This interesting point, surprising to us at the time had, we found, already been demonstrated by Benson and Semenov who also successfully desensitized a patient by inoculations of a mixture of water-soluble bee sting extract and bee body protein. Later Fisher and Center reported a similar successful desensitization with extract of whole bees.

Frankland has stated that an overdose of a watery extract of drones has caused a reaction in a sensitive patient quite indistinguishable from that of a bee sting. The hypersensitivity to the bee sting in sensitive persons is apparently not associated with the injected venom as such but with the bee body protein represented in the venom. Initial sensitization of the victim presumably occurs with the first sting whereby bee protein gains entrance to the tissues in or together with the injected venom.

The point of practical importance that emerges from this finding is that the preparation of extracts for testing and desensitization purposes in cases of bee sting sensitivity becomes a simple procedure. It is easier to prepare an extract from the whole bee than from the stings and poison sacs each laboriously removed from the insects or by the method of allowing bees to sting through a thin membrane covering a container with extracting fluid. Indeed, the question is being considered of deliberately preventing the inclusion of the venom in the bee body extract lest, by its purely toxic effects, it confuse the reading of a true allergic response in the skin test and possibly also interfere with adequate desensitization.

Preparation and Standardization of Bee Protein Extract

Bee protein extract for testing and desensitizing purposes is prepared in our laboratories from whole bees which have been killed with chloroform in a closed container. The bees are washed a few times in a cullender with water-free ether and spread out for superficial drying. The bee bodies are then ground in a mortar into a thick paste and extracted with a moderate excess of Coca's extracting fluid in the cold for 48 hours with frequent stirring. The mass is then squeezed through a clean cloth and the liquid collected is submitted to seitz filtration and sterility control tests.

In several of our experimental studies the bee protein from this extract was readily obtained by precipitation with alcohol, the precipitate being finally recovered as a dry powder after washing with ether and grinding. This powder which may be conveniently stored can, of course, constitute the basic material from which suitable dilutions of bee body protein are subsequently made as desired. The bee body extract, itself, however, has so far been found so suitable that testing and desensitizing has been carried out with it. Bees are readily obtained and fresh extracts are thus always available. Experimental studies are, however, in progress to assess the immunological effectiveness of the crude whole bee extract and the more stable precipitated bee protein.

Standardization of the bee body extract is arbitrarily based on the total protein nitrogen content of the fluid. This 'unitage' is regarded as the 'potency' of the particular batch of extract. The limitations of this method of estimating the allergenic value are, of course, fully realized not only as they present themselves in bee body extracts but also in other proteins used in the study of allergic hypersensitivity. In practice, however, the actual figure is of little importance; it is merely a guide to the dilutions that must later be made.

Preliminary Skin Testing

Before desensitization is carried out, intracutaneous (intradermal) skin tests are done to determine the degree of the patient's sensitivity to the particular batch of bee protein extract in current use. This test serves to determine the strength of the initial desensitizing dose.

For convenience a Skin Test Outfit is made available consisting of a series of capillary tubes containing the bee protein extract in the following graded strengths:

1:10, 50:100, 250:500, 1000:2000 units per c.c.

Where the clinical report has indicated an exceptionally severe reaction to a bee sting an initial testing strength of 1/10 or even 1/100 of a unit per c.c. may be used.
For the actual test commence with the lowest strength (1 unit per c.c.) and, using a tuberculin type syringe, inject 0.02 c.c. into the skin of the volar surface of the forearm. Continue injections in this way with the higher strengths of extracts in the Outfit until a local reaction is just obtained—a wheal of about 0.5 cm. in diameter with a surrounding area of erythema. No further test injections are to be given but the uttage of the reacting extract is noted and reported.

All test injections are given intracutaneously into a fresh area of skin each time at intervals of 20-30 minutes.

The reference number of the bee protein extract used in testing is recorded to ensure that the same extract will subsequently be employed in desensitizing the patient.

DESENSITIZATION BY THE INTRACUTANEOUS ROUTE

Desensitization is carried out by the injection over a period of bee body extracts of gradually increasing strength, commencing with an extract somewhat weaker than the skin test reacting extract. The injections are given by the intracutaneous route because severe reactions are less likely to occur with the smaller doses used and with the slower absorption that takes place from the skin. In addition, the easily recognizable skin reactions provide a useful guide to the size of the injection that is to follow.

The intracutaneous method of desensitization is, in our experience, a simple and effective procedure unaccompanied by severe reactions.

Injections may be given at intervals of 2-3 days but in any event not before evidence of the response to a previous injection has disappeared.

A Treatment Set for desensitization purposes conveniently consists of five rubber-capped 2 c.c. vials containing the bee body extract in a series of graduated strengths determined by the results of the preliminary skin tests.

The following example of desensitization in the case of a person found sensitive by preliminary skin test to 100 units per c.c. of extract will show the general lines of the procedure.

Example: A patient gives insignificant reactions in the preliminary skin tests with the 1.10, and 50 units per c.c. extracts. With the 100 units per c.c. extract, however, a wheal of 0.5 cm. is produced.

For desensitization purposes a Treatment Set is provided containing bee body extract in five strengths as follows:

<table>
<thead>
<tr>
<th>Bottle 1</th>
<th>Bottle 2</th>
<th>Bottle 3</th>
<th>Bottle 4</th>
<th>Bottle 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 units per c.c.</td>
<td>100 units per c.c.</td>
<td>250 units per c.c.</td>
<td>500 units per c.c.</td>
<td>1,000 units per c.c.</td>
</tr>
<tr>
<td>0.10, 0.25, 0.25* c.c.</td>
<td>0.10, 0.25, 0.25* c.c.</td>
<td>0.10, 0.25, 0.25* c.c.</td>
<td>0.10, 0.25, 0.25* c.c.</td>
<td>0.10, 0.25, 0.25* c.c.</td>
</tr>
</tbody>
</table>

* The dose of 0.25 c.c. may be repeated a few times.

The use of stronger extracts (1,500, 2,000, 3,000, etc., units per c.c.) may be indicated and injections are given as before.

A brisk local reaction consisting of a wheal of 0.5-1.0 cm. in diameter is desirable after each injection. Such a reaction elicited with a particular strength of extract warrants a repetition of the same dose a few times before injections with a higher strength of extract are cautiously commenced.

It is, of course, not possible to lay down a strict dosage routine. Each patient is an individual experiment where the size of the dose and the optimum interval between injections must be determined. The physician will, however, readily be able to judge from the reactions that occur whether to repeat the dose or whether to decrease or to increase the next dose.

When the patient is receiving desensitizing extracts of the higher strengths (1,000 units or more) the intervals between such injections may gradually be prolonged to twice weekly, once weekly and finally to an injection once a month or once in two months in order to maintain the state of hyposensitization reached. Bee-keepers and others who are occupationally unable to avoid bee stings but who are sensitive to bee stings and have undergone desensitization should certainly continue to receive injections at 3-4 weekly intervals of 0.25 c.c. of the highest strength of extract well tolerated.

It is a wise precaution to have at hand a 1:1,000 solution of adrenalin hydrochloride when testing or desensitizing bee sting sensitive persons so that any excessive reactions may promptly be brought under control.

EVALUATION OF DESENSITIZATION PROCEDURES

The evaluation of any desensitization procedure in bee sting sensitivity is not an easy matter in practice because subjects do not conveniently get stung by bees to put the method to the proof! A questionnaire was therefore sent to all medical practitioners who in recent years had used the Test Outfit and subsequently the Treatment Set. It was a matter of surprise to discover in this enquiry that most of the bee protein extracts issued were for use in the treatment of 'rheumatism' and, incidently, with good results! Numerous genuine cases of bee sting sensitivity had been tested, however, and submitted to a course of desensitizing injections, but as no further bee stings had occurred, the value of the method could not be determined in this group, except that the progressive skin tolerance to higher doses of extracts suggested an increasingly effective state of hyposensitization. No adverse reports were received.

The following three cases, described by the doctors concerned, appear to provide positive evidence that effective desensitization had indeed occurred.

Case 1. A European boy, 8 years old, 'after a single bee sting became acutely swollen in the pharyngeal area and developed dysphagia. An urticarial eruption appeared which covered large areas of the face, neck, chest and abdomen. The use of the Bee Venom Test Outfit revealed sensitivity to the 100 units per c.c. extract. A series of desensitization injections was given to the child commencing with the 50 unit extract. Three weeks after therapeutic injections had been given the boy was again stung by a bee but only a small wheal appeared with no other ill effects'.

Case 2. A European woman, 49 years of age, 'developed complete collapse and shock, thrice in one year, after being stung by a honey bee. Desensitization was carried out commencing with the 100 unit extract. A few months after the course of treatment ended the patient was again stung by a bee without recurrence of collapse'.

Case 3. A European woman 'was stung by a bee and became unconscious and nearly died. Desensitization was carried out. She was stung again and showed no untoward reaction'.

Although these reports leave much to be desired from a scientific point of view, they nevertheless are suggestive and encouraging.
SUMMARY

The significance of bee body protein is discussed in relation to the sensitivity reactions exhibited by bee sting sensitive persons.

A method is described of desensitizing bee sting sensitive persons by the intracutaneous injections of graded strengths of extract of bee body protein.

Details are given of the preparation and standardization of this extract.

A description is given of the preliminary skin tests necessary in determining the degree of the patient's sensitivity to bee body protein before desensitization is commenced.

The difficulty of evaluating any method of bee sting desensitization is emphasized, but three cases are quoted in which effective desensitization appears to have been achieved by the method described.

REFERENCES


STAGHORN CALCULUS OF THE KIDNEY

REPORT ON A CASE

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The usual treatment of staghorn calculus of the kidney is either to leave the kidney alone or, if the condition is unilateral and the patient has symptoms referable thereto, to perform a nephrectomy. The dangers of a conservative nephrolithotomy are considerable and include the following:

i. The need to remove the kidney forthwith due to inability to expose the pedicle or to haemorrhage;
ii. Subsequently the need to perform a secondary nephrectomy, due to sepsis and to secondary haemorrhage;
iii. Still later, the rapid re-growth of the stone due to sepsis and small fragments of the original calculus left behind, or a useless, painful kidney.

Nevertheless, the following case illustrates that despite the many difficulties and dangers, a good result can be obtained, and undoubtedly with further discoveries and improvements in technique, the operation will be performed more frequently than hitherto.

Mrs. G. H., aged 25, was admitted to Groote Schuur Hospital on 30 October 1950 complaining of general debility and tiredness. Ever since the age of 12 she had complained on and off of pain in the right side. Investigation carried out at Groote Schuur Hospital in 1939 and again one year later showed a mild degree of dilation of both pelves, more marked on the right side. Investigation carried out at Groote Schuur Hospital in 1939 and again one year later showed a mild degree of dilation of both pelves, more marked on the right side and some dilatation of the right ureter also. In 1945, for the same complaint, she had had an appendicectomy and removal of a cyst of the ovary. Ten months ago during her third pregnancy she was treated for pyelitis and hypertension. Six weeks ago for the first time she had an attack of sharp stabbing pain in the left side. Investigation on admission showed the following features:


Urine. Catheter specimen:—Fair number of pus cells. B. proteus on culture; sensitive to Streptomycin, not to Penicillin.

Indigo Carmine Test

Urea Concentration Test for 1 hour

Cytology and Culture

<table>
<thead>
<tr>
<th>Test</th>
<th>Left Kidney</th>
<th>Right Kidney</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigo Carmine Test</td>
<td>5 minutes</td>
<td>4½ minutes</td>
</tr>
<tr>
<td>Urea Concentration Test</td>
<td>40 c.c. collected 1·75% urea</td>
<td>50 c.c. collected 3·2% urea</td>
</tr>
</tbody>
</table>

At the end of the above test the bladder was catheterized and 40 c.c. obtained with a concentration of 1.4% urea. This low concentration was due probably to fluid left behind after cystoscopy. A few days later urine from the bladder showed pus cells and B. proteus infection.

The decision to attempt the removal of the calculus and to preserve the kidney was taken on the following grounds:

i. The youth of the patient;
ii. The fact that the right kidney could not be regarded as completely normal;
iii. The mild infection and X-ray characteristics of the calculus. From these the calculus appeared to be well consolidated and stationary.


An incision was made through the bed of the 12th rib after resecting most of the rib. The kidney was easily delivered, the pedicle exposed and compressed with curved intestinal clamps, covered with rubber. An incision was made along the convex border of the kidney from pole to pole right down to the calculus, which was removed.