TUBERCULINS AND VACCINES

FROM THE GENERAL PRACTITIONER'S
POINT OF VIEW.*By E. HAYLING COLEMAN, M.D. CANTAB.,
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I do not propose to go into the theory of vaccines or to produce statistics, but to note a few points which have occurred to me through my experience as a general practitioner, and may be of service to those who have not so far made use of vaccines and tuberculins. I bracket these, for I believe that the tuberculin which is increasing in favour, and will eventually supersede the others, is the bacillary emulsion (B.E.) and this is practically a vaccine. The organisms are ground up in an agate mortar before being mixed with the diluent.

For diagnosis, old tuberculin T.A.—a solution chiefly of the exotoxins, prepared by filtering a sterilized tubercle culture through porcelain—is usually employed.

The question of expense is often important, and here the employment of stock or autogenous vaccine comes very much to the fore, more so in some places than others. Here we are fortunate, for the new pathological laboratory attached to the Wolverhampton General Hospital prepares autogenous vaccines at a very moderate fee. Some time ago a patient of mine consulted a London physician, and was provided with an autogenous vaccine for chronic nasal catarrh. The fee was 30 guineas, and the patient was not at all benefited by the course of injections. Last year another patient had a similar vaccine for a similar purpose prepared at our laboratory—fee, 2 guineas. He was markedly benefited by the treatment, and showed his appreciation by urging several of his friends to apply for the same treatment.

In deciding whether or no to use a vaccine many considerations arise, and the cases may be roughly divided into four groups:

1. Those in which a vaccine is usually successful and more likely to succeed than other remedies which used to be employed aforetime.
2. Those in which ordinary remedies have so far failed, and we know that a vaccine may cure, though not so frequently as in Group 1.
3. Cases of serious disease, in which the use of a vaccine can do no harm, and may decidedly increase the patient's chance of recovery.
4. Cases in which, though vaccines often fail, yet other remedies do so almost invariably.

There are also a number of cases which, though not cured by vaccines, yet may be very much relieved by their use.

Group 1.

Amongst these cases are those of recurring boils and carbuncles; here a vaccine rarely fails. A stock vaccine usually succeeds, but when the patient can afford it I certainly prefer an autogenous vaccine. These are cases in which there is no special urgency, so that there is time to prepare the vaccine from the organisms found in the patient's own boils. I do not remember a single failure with an autogenous vaccine used for this trouble, but I have known a stock vaccine fail occasionally.

I have had very good results from a vaccine in a very widespread, pustulous rash accompanying scabies.

Other cases which are very much benefited by a vaccine are those of chronic nasal and post-nasal catarrh when this is due to the pneumococcus. I have now a case of this which has benefited most remarkably; even some accompanying deafness of over ten years' standing is distinctly better.

The chronic tracheitis of old people—commonly called bronchitis—is also often due to an infection by the pneumococcus, and here a vaccine will often work wonders, but usually it must be repeated. Here also I much prefer an autogenous vaccine.

The cystitis due to infection of the bladder by *B. coli* usually clears up quickly with a vaccine. An autogenous vaccine is almost imperative owing to the large variety of

coliform organisms which exist. Amongst these cases the most successful are those in elderly women.

There are, however, one or two points of caution in dealing with cystitis due to *B. coli*. If the patient be an old man with a large prostate and some residual urine, then the vaccine will fail. I tried to get over this difficulty by combining vaccine treatment with regular irrigation of the bladder by antiseptic solutions. The result, though not a cure, was better than with either method of treatment alone. Another point in dealing with a bacilluria is to be sure that the urine is kept alkaline.

Vaccine is also very successful in cases of chronic gleet and in some of the secondary infections of gonorrhoea, and I have found it useful in a case of only a few weeks' standing. It is, however, a difficult vaccine to prepare, and a stock vaccine rarely does much good.

Group 2.

Amongst these there may be placed acne, for though vaccines are often very successful, yet they often fail. I have known a stock vaccine give good results, but an autogenous is generally preferred.

I would also place here nasal catarrh not due to pneumococci. I have had some success, but not nearly as much as I had hoped, from my reading of published results.

I have seen a case of obstinate catarrhal asthma, which had for weeks resisted everything, yield almost at once to a vaccine prepared from the patient's nasal organisms. I have used a vaccine in hay fever, with no benefit, but have not tried the pollen vaccine.

I have used Bordet-Gengon's whooping-cough vaccine, and certainly those cases in which I used it got well in good time.

In nasal and tracheal infections two or more organisms are often present, and a mixed vaccine must be prepared, and the proportion of its constituents varied during treatment as one or the other organism yields more readily.

Group 3.

Perhaps the most important disease in this group is pneumonia. I am well aware that I am on debatable ground, but I have never heard of any harm following the use of vaccine in pneumonia, and I have had some very good results from its use. I begin directly I believe the case to be one of pneumonia, and repeat the dose if the temperature rises again after the fall, which usually follows within twelve hours of the injection. This is essentially an instance in which a stock vaccine must be used, as the patient may be dead or better before there is time to prepare an autogenous vaccine. Some start with a stock and go on with an autogenous vaccine when ready.

General septic infections also come under this head—septicaemia and malignant endocarditis.

Group 4.

As we get more skilful in the preparation and use of vaccines this group will grow smaller. At present I fear the general practitioner will place in it a number of diseases.

A prominent member of this group is rheumatoid arthritis. Here, at times, a vaccine may do good or arrest the progress of the disease. The most promising cases are those due to septic absorption from the pus about the teeth in pyorrhoea; the vaccine should be prepared from this pus. So far my experience has not been hopeful. I am inclined to believe that the difficulty is due to the dense tissues and poor vascular supply of the parts which are affected in this disease. I would compare with it chronic suppuration of the middle ear; here, also, I have found vaccines fail. Colitis, some skin cases, and septic anaemias may also be mentioned here.

Dosage.

The reaction of the patient to the first dose must be the guide; if it be severe then the second dose should be only slightly, or not at all, increased.

The first dose will be regulated by the urgency of the case and the condition of the patient. In a bad case of pneumonia a full dose should be given; in a case of a frail invalid with bronchopneumonia a small dose at first, lest

* Read before the meeting of the Staffordshire Branch of the British Medical Association.

the reaction should injure the patient. I usually give 50 million in an acute case and 20 in a chronic.

In a case of pleurisy in a boy (about 5 years old) I once gave 75 million for the second dose. His temperature rose the same day to 104° from only just above normal. It soon came down, and the patient made a complete and rapid recovery, though a surgeon who had seen him before the injection thought an empyema was present and needed operation.

The interval between the first and second injection should usually be about four days, gradually extended by a day to eight days, and then a day more every second or third injection. In a few cases where the patient's condition is critical an injection may be given daily. In some to maintain the improvement the injections must be continued over a long time at intervals of, say, once a month; in these cases the vaccine does not eradicate but keeps down the disease. If an injection is followed by a rise of temperature this must have quite subsided before the next dose is given.

Site of Injection.

It is of no importance at all where the injection is given so long as it is in a region where the vaccine can be readily absorbed into the general circulation. If the dose is bulky, or when using concentrated vaccines and tuberculins, it is wise to choose a place where there is plenty of loose connective tissue. For this reason the arm above the elbow is preferable for large doses, and the injection must be made well below the skin. At times I have found that when injections given below the elbow caused unpleasant swellings, the difficulty was overcome by giving them above the elbow.

Between the shoulders was a site often chosen; a disadvantage is that if there is any local reaction it may make it awkward and painful for the patient to lie down. It has the advantage that it impresses the patient more, and would be useful for this reason in those cases in which there is a neurotic element. In dealing with our modern rulers—the great unwashed—it is well to paint on the skin a spot of iodine solution and inject through this; with others it is enough to clean the skin with spirit. When withdrawing the needle I always press on its track with a pad of wool to close it, and wipe off any spot of vaccine which may have escaped. The needle and syringe must be scrupulously sterilized, and should be washed out with spirit directly after use; if left to do at a more convenient time the piston may have stuck to the barrel.

The needles I prefer are those made like a dentist's injection needles. The needles (supplied in sterilized tubes) are separate from the mount, to which they can be readily attached; by using these one always has a sharp point and can use a new needle every time if advisable. I always keep a platinum-iridium needle in reserve, but they get blunt far too readily.

Any readily sterilized syringe will do, but the long narrow ones have the advantage that it is very easy to regulate the dose with great accuracy. As metal expands more readily than glass, if a glass syringe be boiled with a metal piston in position the glass will probably break. I prefer the syringe to be graduated in cubic centimetres, but this is immaterial, though it is necessary to make sure whether the strength of the vaccine is stated per cubic centimetre, or per 20 minims, or per phial. I have known the label to be most annoyingly ambiguous on this point.

If a small file is not at hand, a key with a hole up the stem does excellently for breaking off the point of the vaccine phial, which should always be well shaken before being opened, as the organisms are apt to settle at the bottom and so spoil the dosage. An important point is always to make a note of the date of injection and the dose at once. When using a series of phials put up in a box, the inside of the lid or bottom of the box makes a convenient place for a prompt note that will always be at hand when giving the next injection.

Tuberculins.

Those who have used tuberculin most are those most strongly convinced of its value, and their conviction increases as time goes on. Often objectors have not used it in suitable cases or in the right way. So many when asking for a remedy for tuberculosis mean something which will cure advanced cases. So far this is still to seek, and I fear will be for many a long day.

Tuberculin is an important aid to diagnosis, whereby we can be positive in cases where without it we should still be in doubt. It is in discovering tubercle in its early curable stages that our chief hope lies in dealing with a disease whose annual death-rate is equal to 75 per cent. of our total killed for the first year of war. I am aware that some hold the use of tuberculin for diagnosis to be risky, but their reasons when examined do not convince; the ability to diagnose tubercle in its early stages is of such paramount importance that even if there were some slight risk it would be justified.

We are told that the injection may stir up latent trouble, but we should not test a perfectly healthy individual, and, if tubercle be found, is it not reasonable to suppose that it is at the root of the trouble which caused the patient to consult us, and not really latent at all? It is just this "stirring up" of an existing tuberculous focus that is such a valuable aid in diagnosis, often enabling us to localize the trouble. This "focal reaction" clinches our diagnosis. It soon subsides, and in a few days the patient is better than before.

It is also frequently stated that nearly every one would react to tuberculin. I have personally found this is not the case. When we consider the large number of people who have tuberculous trouble at some time, and overcome it, it is not at all surprising that a positive reaction is so often obtained. No doubt many of these early cases would get quite well without special treatment, but if treated, we may be fairly safe in saying that nearly all will recover.

In employing tuberculin for treatment, it is most important to have the patient's temperature taken regularly, as this settles the dosage. A marked rise would lead one to repeat the last dose or only slightly increase it; further, no dose should be administered until the reaction set up by the previous one has quite subsided.

Provided no mixed infection is present, tuberculin can be administered to a patient with fever so long as the temperature has been noted for a few days previously, in order that we can recognize a reaction on the chart.

The dose is usually increased by 50 per cent. each time in cases showing no, or only slight, reaction. I begin usually with 1.000 c.cm., and have safely worked my way up to a dose which, if given at first, would have produced a startling reaction. I begin with two clear days' interval, and slowly extend, as the dose increases, to some weeks when using undiluted tuberculin.

A question of great importance is the matter of mixed infection, and I believe that most failures are due to this not being recognized. I have had some of my best results by combining Dr. Curle's nascent iodine treatment with B.E. I believe the iodine acts on the adventitious infection, and the B.E. then has a fair chance with its own bacillus. I have also known good from the use of a vaccine made from the adventitious organism along with tuberculin.

Though many of our cases are past being cured, yet by the use of tuberculin we can very much delay the progress of the disease.

Another very important point we find in treating a patient with tuberculin is that the sputum becomes less infective, the tubercle bacillus often completely vanishing, even though, from symptoms and physical signs, we know the disease has still a strong hold. This is of great value in preventing the spread of infection.

Some fear giving tuberculin in cases with hæmoptysis; I have never known harm follow. In dealing with a number of advanced tuberculous patients a certain proportion will have hæmoptysis, and if we treat them with tuberculin we shall still have some instances, though fewer, and these occur in spite of the treatment, not in consequence of it. If the dose given to a patient were largely increased and a severe reaction produced, hæmoptysis might be caused, but the fault would be, not with the remedy, but with the method of employing it.

THE Committee of the French Surgical Association has decided that the French Congress of Surgery shall not meet till after the war. It has also resolved to expel all German, Austrian, Bulgarian, and Turkish members.

THE Duma has passed a law authorizing the sale of wine in the wine-growing regions of Russia during the war; afterwards the sale of wines containing more than 12 per cent. alcohol will be prohibited. The law does not affect the prohibition of the sale of vodka.