

THE COLLEGE OF NURSING LT., D.*Sister Tutors Section***Notes of Lecture on Serum Therapy**

BY

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*Director of Clinical Medical Unit, St. Thomas's Hospital.**Serum-Therapy* can be divided into two groups:—

1. *Non-Specific* i.e., not given for a specific organism but to improve general condition of the patient.
2. *Specific* mode of treatment which includes measures which act by assisting the natural methods of immunity.

Until recently, methods employed have been almost wholly non-specific.

Science of Immunity is the relation of bacteriology to serum-therapy. It is most necessary to have a true and accurate knowledge of the bacteriology of the disease to be treated.

Rough Grouping of Microbic Diseases:—

1. Those for which specific treatment is not known.
Ex :—Measles, Mumps, etc.
2. Where causative agent is known, specific remedies can be prepared.
Ex :—Diphtheria, Tetanus, etc.
3. Where cause is not known with certainty but specific treatment is used because the manifestations are the same as in 2.
Ex :—Scarlet Fever, Rheumatic Fever, Influenza, Whooping Cough.

Immunity is the Interaction between infection and the body tissues. Due to the pouring out of poisons (toxins) of the invading germ.

1. Exotoxins are Toxins produced in tissues where bacteria thrive.
Ex :—Tetanus, diphtheria, etc.
2. Endotoxins are Toxins *within* the bacteria not given out until they disintegrate.
Ex :—Cholera, typhoid, Staphylococcus etc.

Antibodies are substances formed in the blood—of highly complex chemical nature. May lead to various results.

1. Destruction of toxins—*Antitoxins*
2. Destruction of organisms—*Bacteriolysins*
3. By stimulating leucocytes to phagocytosis—*Opsinins*

Specific Therapy has as its object the artificial increase of these properties. Normally the body is forming antibodies every day.

I. The patient may be supplied with ready-made antibodies—a condition called *Passive Immunity*.

II. The patient may be induced to produce his own antibodies—*Active Immunity*

PASSIVE IMMUNITY is confined to immunized sera.

ACTIVE IMMUNITY is generally acquired by vaccines.

Sera are produced by injection of increasing doses and of increasing strength into an animal (usually a horse) until he has made enough antibodies to make him immune against that disease. The serum is then drawn off aseptically from his jugular vein and rendered suitable for injection.

Bacterial Vaccines are Micro-organisms in weakened form in saline or weak antiseptic. The germs are killed at low temperature (60°C) in order that the endotoxins may not be destroyed.

Occasionally a serum and a vaccine are used together. This is called a *sensitized vaccine*. Not much is known about the value of this so far.

Choice of Specific Remedy depends upon :—

1. Nature of infection
2. Whether infection is local or general
3. Whether acute or not
4. The stage the disease has reached.

Immune Sera act rapidly and the action is transient.

Vaccines act more slowly but the action is more prolonged.

The action of vaccines depends upon the power of the body to be "educated" to form antitoxins.

N.B.—The more acutely and generally ill the patient may be the more likely *Immune Sera* (i.e. antitoxin sera) will be valuable. The more chronic and localized the disease, the more likely *vaccines* will be valuable.

Methods of Administration of Sera.

- | | | |
|-------------------|-----|-----------------------|
| 1. Subcutaneously | ... | the best |
| 2. Intravenously | ... | } never satisfactory. |
| 3. Per Rectum | ... | |
| 4. „ Mouth | ... | |

Non-specific Results on Patient "Serum-Sickness"—due to introduction of *any* foreign serum into the body. It can be produced by quite normal serum.

Symptoms of "Serum-Sickness"

1. Local and general symptoms of malaise. Raised T.P.R.
2. Urticaria.

3. Albuminuria (often mistaken for truenephritis).

4. Swollen glands, etc., etc.

Serum-Sickness is never serious or dangerous, merely acutely troublesome.

Anaphylaxis (most important)

Some patients who have previously received any serum remain in a sensitized condition to foreign serum, therefore when they have serum injected into them a second time, serious and often dangerous disorders result, characterized by :—

1. Acute headache
2. Acute vomiting
3. Running, uncountable pulse
4. Acute dyspnoea and cyanosis
5. Coma
6. Death.

Therefore always ask a patient if he has ever had serum injected before, if so, start with very small dose at first and watch the effect carefully until it has been proved harmless before giving larger dose.

Methods of Giving Vaccines.

1. Subcutaneously—much the best
2. Intravenously—often followed by profound disturbance (protein shock).

Local Effect (often not present)

Swelling, pain soreness, etc.

General Effect

Malaise, etc., within 12—24 hours of injection.

It is always best to warn a patient what he may expect.

N.B.—Vaccines should always be used *fresh*, not stored in cupboard as they lose their potency with keeping.

Prophylactic Use of Vaccines, for :—

1. Typhoid
2. Cholera
3. Plague
4. Influenza.

Grades of Vaccines.

1. *Autogenous* are much the best, and are made from the patient's own germs.
2. *Stock Vaccines* used when :—
(a) Vaccine is used for prophylactic purposes

(b) When nature of the germ is certain but the germ cannot be isolated

Ex :—gonococcal joints, etc.

(c) When there is difficulty or delay in preparation of autogenous vaccine.

Choice of Dose.

Every individual varies. Dosage must depend on local and general response and the doctor's common sense.

Time interval 5—10 days between doses.

Before Giving Vaccines :—(advice to students)

1. Make an accurate diagnosis
2. Use a culture freshly prepared
3. Start with small increasing doses
4. Give enough interval between the doses
5. Don't expect immediate response
6. Use every other known reliable remedy first.

Types of Vaccines are in use for :—

1. Staphylococcal—Strepto-coccal Infections
2. Pneumonia
3. Gonococcal infections
4. Bacillus Coli
5. Typhoid (in acute stages only) (great successes in Australia)
6. Influenza
7. Nose and throat cases—Bronchial catarrh

T. B.—(All tuberculins are modified forms of vaccines.)

Types of Antitoxic sera in use are those for :—

1. Diphtheria (including Schick test)
2. Meningitis
3. Pneumonia
4. Chronic and local infections—boils, etc.
5. Infective Endocarditis (never much use)
6. Arthritis—much abused.

The palm tree that grows on the banks of the Amazon possesses the largest leaves of any. Its leaves are from 30 to 50 feet in length and from 10 to 12 feet broad.

The roar of the lion can be heard farther than the sound of any living creature. Next comes the hyaena, then the screech owl, the panther, and the jackal in succession. The donkey can be heard fifty times farther off than the horse, and the cat ten times farther than the dog. Curiously, the quiet and timid hare, when she cries in fear, can be heard farther off than either dog or cat.