Serology and vaccinology

مصول ولقاحات

Lec1

د.مروة عباس كبة

2022-2021

Serology: علم المصول

Is the scientific study of blood serum. It refers to the diagnostic identification of antibodies in the serum. Such antibodies are typically formed in response to :

- infection (against a given microorganism),
- against foreign proteins (in response, for example, to a mismatched blood transfusion),
- or to one's own proteins (in instances of autoimmune disease).

Serological tests: الفحوصات المصلية

may be performed for diagnostic purposes when an infection is suspected, and in many other situations, such as checking an individual's blood type. Serology blood tests help to diagnose patients with certain immune deficiencies associated with the lack of antibodies.

Serology techniques: التقنيات المصلية

There are several serology techniques that can be used depending on the antibodies being studied

. These include: ELISA,

Agglutination

, precipitation

Some serological tests are not limited to blood serum, but can also be performed on other bodily fluids such as semen and saliva, which have (roughly) similar properties to serum.

If antibodies are found, you may: عند وجود الاجسام المضادة في مصل الدم هذا يعني ان

• Have a current infection

• Have been infected in the past

• Have immunity to a certain organism and are unlikely to become sick

Some of the different diseases that can be detected include:

بعض الامراض الممكن تشخيصها بواسطة الفحوصات المصلية تشمل؟

Amebiasis

• Anthrax

• Brucellosis

• Human immunodeficiency virus (HIV)

Fungal infection

• Measles

• Rubella

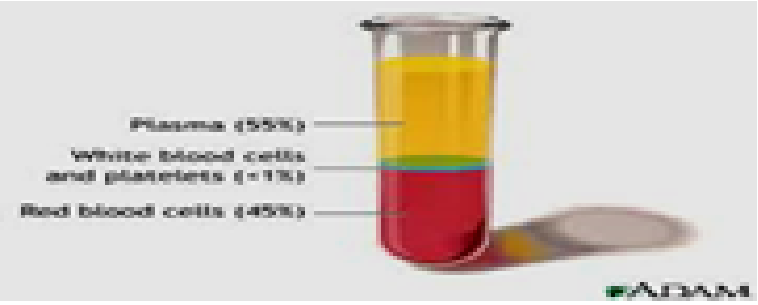
• Viral hepatitis (various types)

Blood serum مصل الدم

In blood, the serum is the component that is neither a blood cell nor a clotting factor; it is the blood plasma with the fibrinogens removed. Serum includes all proteins not used in blood clotting and all the electrolytes, antibodies, antigens, hormones, and any exogenous substances (e.g., drugs and microorganisms).

Blood plasma بلازما الدم

Blood plasma is the yellow liquid component of blood, in which the blood cells in whole blood would normally be suspended. It makes up about 55% of the total blood volume. It is mostly water (90% by volume) and contains dissolved proteins, glucose, clotting factors, mineral ions, hormones and carbon dioxide



Vaccination التلقيح

Introduction

It was recognized long ago that individuals who survived smallpox , plague, and cholera rarely contracted the disease again, even when surrounded by others suffering from that particular disease. early form of vaccination developed as attempts to confer protection from these fortunate survivors to those who still faced the risk of severe illness or death. Among ancient cultures , the Egyptians and Chinese exposed individuals to powders formed from the crusts and scales of pockmarks taken from individuals recovering from smallpox(*variola major virus)* .sometimes individuals who were treated in this way developed mild form of the disease, or they developed no apparent disease at all.

1794-Edward Jenner demonstrated that intentional inoculation with material from individuals with cowpox(*Variola*)protected against smallpox

1870s- .people found it hard to believe that it really worked. They also felt that took away peoples civil liberties, particularly when it was compulsory.

1880s-Louis Pasteur improved vaccination even more , and developed a rabies vaccine.

1890- Emil von Behring was awarded the first Nobel Prize. He discovers the bases of diphtheria and tetanus vaccines by demonstrating that animals injected with small amounts of the tetanus toxin became immune to the disease.

1920s- by the end of this year vaccines for diptheria, Tetanus, whooping cough and tuberculosis(TB) were all available. Vaccination spread across the globe and although these early vaccines were crude, they worked. The first vaccination programme dramatically reduced the number of deaths from disease , and they were important in establishing the concept of preventive public health measures.

1955- Polio vaccination was introduced in UK and it dramatically reduced the number of cases.

1956- the first attempt to use the smallpox vaccine on a global scale began when the World Health Organization (WHO) decided to try and eradicate smallpox across the world. Smallpox was declared as being eradicated in 1980, it was on of the most remarkable achievements in the history of nedicine.

2008- professor Harald zur Hausen discovered that cervical cancer was caused by a virus making it possible to develop a vaccine for the diease.

The scientist proved that a group of viruses called human papillomaviruses (HPV) caused cervical cancer. This discovery led to the deveplopment of the HPV vaccine, which protect against cervical cancer, and is now widely available.

2008-in England , the national health service , cervical cancer vaccination programme began, whereby 12-13 year-old girls are offered HPV vaccination to protect them against cervical cancer.

It was first time that a routine universal vaccine has been given to prevent type of cancer.

2013- the NHS vaccination programme saw the introduction of rotavirus vaccination for babies and a shingles vaccine for over 70-year old.

A children's flu vaccine was lunched this is given as a nasal spray rather than an injection.

2015- the NHS vaccination programme saw introduction of Men B vaccination for babies. The programme is the first national, routine, universal and publicly funded Men B vaccination programme in the world.

Vaccination improve life:

- **The expanded use of vaccination led to** an enormous improvement in human and animal health. For both children and adults, many of the most fearful diseases throughout human history have been practically eliminated in many parts of the world .

- **the ability to vaccinate early in the life has dramatically reduced the burden of illness**, crippling and death that was once a routin part of childhood, resulting from diseases such as diphtheria, polio and measles.

Note:

- Childhood vaccination is usually provided as a routine service in maternal-child health clinics or other health facilities.
- Children should receive the vaccinations they need at the right age during scheduled or drop in clinic vistis
- Most countries have a recommended vaccination schedule, that is, the ages at which children should receive each does of various vaccines.

Terms and definitions: تعاريف ومصطلحات

A vaccine is a suspension of whole (live or inactivated) or fractionated bacteria or viruses that have been rendered non-pathogenic, and is given to induce an immune response and prevent disease. Two points are considered in vaccine production 1-specificity 2-memory

- ✓ The term vaccine was derived from vacca meaning cow, since Edward Jenner used cowpox virus (Vaccinia) to prevent smallpox infection.
- ✓ Vaccination is aimed to inducing active immunity in an individual.
- ✓ **Immunization**: a process by which a person becomes protected against a disease through vaccination

Vaccination : تعريف التلقيح

the act of introducing a vaccine into the body to produce immunity to a specific disease. Upon that subsequent contact with the microorganism following natural infection induces strong protective immune response. The protective immunity may involve secretion of neutralizing antibodies or production of memory cytotoxic lymphocytes of T cells.