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Medical laboratory science
Introduction to medical laboratory science II
MLS 202

Question
1. Write on the purpose of fixation
2. List 5 compound fixatives and composition

1. Purpose of fixation

Fixation is the preservation of biological tissues from decay due to autolysis or putrefaction. It is a process by which the cells or tissues are fixed in chemical and partly physical state so that they can withstand subsequent treatment with various reagents, with minimal distortion of morphology and no decomposition. Shortly after death or removal from the body, cells and tissue begin to undergo changes, which results in the air breakdown and ultimate destruction. These are referred to as post-mortel changes, which may either be putrefactive or autolytic in nature. Putrefaction is due to invasion of the tissue by bacteria, which generally disseminates from alimentary tract and spread quickly into the surrounding organs causing decomposition. Autolysis is due to action of enzymes from dead cells.
Fixation is achieved through chemicals called fixatives. The following are purpose of fixation:
a. To kill the cell quickly without shrinking, swelling, or other distortion.
b. To permit at a later date the application of numerous staining procedures in order to render the constituents of the tissue and cell more readily visible
c. To permit the restoration of natural colour for photography and mounting as museum specimens
d. To inhibit bacterial decay (putrefaction) and autolysis (enzymatic degradation)
e. To render the substance of the cell insoluble and give good optical differentiation
f. To prevent tissues from changing their shape and size during processing
g. To harden the tissues

2. COMPOUND FIXATIVES

A fixative is a substance which will preserve after death the shape, structure, relationship and chemical constituents of tissues and cells. A fixative could be ‘simple or compound’. Compound fixatives are the product of two or more simple fixatives mixed together in order to obtain the combined effect of their individual actions upon the cell and tissue constituents. A compound fixative could be micro-anatomical or cytological.
a. Zenker- Formol (Helly’s)
b. Bouin’s fluid
c. Carnoy’s fluid
d. Gendre’s fluid
e. Neutral buffered formalin

Zenker-formol (helly’s)
Composition: mercuric chloride(5g), potassium dichromate (2.5g), sodium sulphate (optional...1g), distilled water(100ml). 5ml of 40% formaldehyde is added just before use.

Bouin’s fluid
Composition: saturated aqueous picnic acid(75ml), 40% formaldehyde (25ml), glacial acetic acid (5ml).

Carnoy’s fluid
Composition: absolute alcohol (60ml), chloroform (30ml), glacial acetic acid (10ml)

Gendre's fluid
Composition: glacial acetic acid (5ml), 95% saturated picric acid in alcohol (80ml), 40% concentrated formaldehyde (15ml).

Neutral buffered formalin
Composition: anhydrous sodium dihydrogen phosphate (3.5g), anhydrous dis odium hydrogen phosphate (6.5g), 40% formaldehyde (100ml), distilled water (900ml).