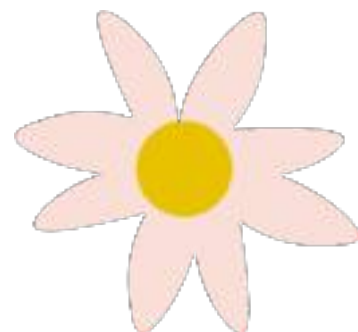






AFOQ

SUMMARIES
GENERAL PATHOLOGY

By: R.M.H

Lect. 2

Cell injury

د. سامح غازي

Phathology

* Cell injury ⇒ تلف الخلية لإصابة معينة

* injurious agents ⇒ ① Microorganism → Bacteria
[Causes] → virus
→ Fungi
→ Parasite.

→ ② chemical toxins

→ ③ Ischaemia - hypoxia ⇒ ↓O₂
↓ blood supply ischaemia و hypoxia هما متماثلتان *

ischaemia تؤدي إلى hypoxia

→ ④ Physical → trauma.
→ heat
→ cold
→ irradiation.
الإشعاع

→ ⑤ Nutrition ⇒ لوغلة التغذية يمكنه
تؤثر على الخلية
التغذية.

→ ⑥ Allergy ⇒ حساسية

→ ⑦ Genetic disorder.

* Enumerate causes of cell injury:-

- نقاط
- ↳ Microorganism.
 - ↳ Toxins
 - ↳ Physical
 - ↳ Nutrition
 - ↳ Allergy
 - ↳ ↓ Blood supply & ↓ O₂.
 - ↳ Genetic Disorder.

* إما أن تكون هذه الأسباب
weak ←
Strong ←

* weak [non lethal] → Change in metabolism & morphology of cell ⇒
غير قاتل / ضار

[تعمل تغير في التفاعلات الكيميائية وتغير في شكل الخلية]

[Degeneration] يؤدي إلى
Reversible cell injury

* Strong [Lethal] → death of cells
قاتل

↓
Irreversible
cell injury.

Mention Results of cell injury.

↓
lethal injurious agents

↓
Irreversible cell injury

↓
death of cells

↓
Non-lethal
injurious agents

↓
Reversible cell injury.

↓
Degeneration.

injurious agents

إزالة

←

Reversible agents

* شرح

death of cell

إلى

degeneration

* محالة تحول

لواستم لفترات طويلة

death of cells

programmed single cell death

← غير منتظمة وغير متعديها مسبقا

unprogrammed death of group of cells

Apopotosis

(منتظمة من قبل الجها: المائي)

Necrosis

* Definition of Degeneration ⇒ Metabolic & morphological change in a tissue.

* Degeneration



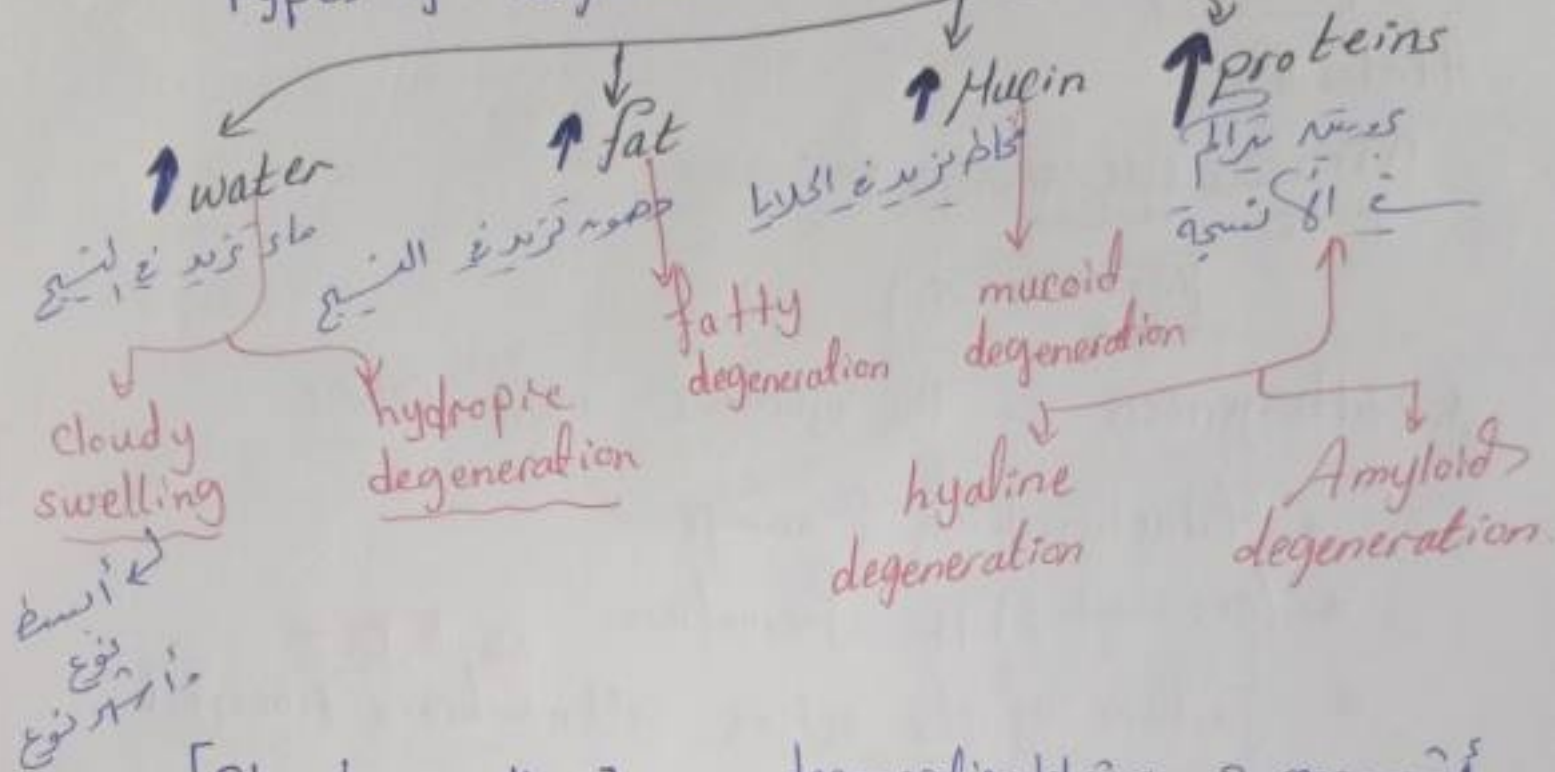
[Nucleus not affected]

* إذا تدهورت النواة تؤدي إلى موت الخلية

* Causes of degeneration ?

↳ Non lethal injurious agent

types of degeneration according to



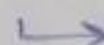
* [Cloudy swelling] ↳ degeneration في 3 أعضاء (3 organs)

liver
kidney
heart

⇒ cloudy swelling ⇒ mildest - commonest form of degeneration

↳ Reversible.

↳ swelling of cells



الخلية التي
تتورم
cloudy
swelling

↳ granularity of cytoplasm

(تظهر حبيبات في السيتوبلازم)

* Mechanism of Pathology:-



ATP $\rightarrow$ Cell Transport membrane
[Na⁺K⁺Pump]

* Pathogenesis $\Rightarrow$ The injurious agent causes

* Mitochondrial Damage

* loss of ATP formation.

* Failure of the active cell membrane transport Na-K Pump

* Na⁺ enters the cell.

* Potassium out of the cell.

* Excessive intracellular sodium is followed by accumulation of water inside the cell.

انتفاخ الخلايا
[انتفاخ الخلايا] الماء داخل الخلية

* Pathological lesions:- $\rightarrow$ Gross Picture [GP]
= Naked eye appearance.
= Macroscopic Picture
 $\rightarrow$ Microscopic Picture.
[MP]

liver الكبدة
capsule غشاء



Normal
liver

* Microscopic Picture

- ↳ The cells are swollen.
- ↳ granular cytoplasm.
- [due to damaged mitochondria]
- ↳ The nucleus is normal



* Gross Picture

cloudy swelling } ↑ size
pale color

* Rounded borders

* tense capsule.

* Soft

← * bulging out surface.

* Enlarged

soft

firm

hard.

as fat

as cartilage

as bone.

- water
- fat
- Mucin.

- protein.

- Calcium.

- fibrous tissue

* Questions:-

- 1 Cell death is a sign of :-
⇒ Irreversible cell injury.
- 2 Depletion of ATP in the cell is due to :-
⇒ Mitochondrial damage.
- 3 Programmed cell death is called :-
⇒ [Apoptosis]
- 4 The following agents are causes of tissue injury except:-
A. Bacteria, viruses & fungi ✓
B. Chemical toxins. ✓
C. hypoxia. ✓
D. hyperplasia. D. hyperplasia.
- 5 cloudy swelling is due to intracellular accumulation of :- Sodium Na^+
- 6 The following organs are affected in cloudy swelling except :-
A. liver
B. heart
C. brain C. brain
D. kidney.
- 7 The following could distinguish apoptosis from necrosis ⇒ A single cell death.