



BASIC PATHOLOGY/FIRST COURSE

INFLAMMATION

Sawa University

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قسم تقنيات الاشعة والسونار

. Third Stage

المرحلة الثالثة

محاضرة رقم 2:

الجانب النظري

Lecture No. two

Theoretical

تدريسي المادة : م.م فاضل عوفي عواد

INFLAMMATION: PATHOPHYSIOLOGY & MORPHOLOGY

DEFINITION & PURPOSE

- Inflammation is a protective response involving host cells, blood vessels, and proteins.
- Its goal is to eliminate the initial cause of cell injury and remove necrotic cells and tissues.

LEARNING OBJECTIVES

- Define inflammation and its importance.
- Differentiate between acute and chronic inflammation.
- Describe vascular and cellular events of inflammation.
- Recognize morphologic patterns and outcomes.

CAUSES OF INFLAMMATION

- Infections (bacterial, viral, fungal, parasitic)
- Tissue necrosis
- Foreign bodies
- Immune reactions (hypersensitivity)

CARDINAL SIGNS

- Rubor (redness)
- Calor (heat)
- Tumor (swelling)
- Dolor (pain)
- Functio laesa (loss of function)

ACUTE INFLAMMATION

- Immediate, early response to injury.
- Characterized by exudation of fluid and plasma proteins.
- Predominantly neutrophilic infiltration.

VASCULAR AND CELLULAR EVENTS

- Vasodilation → Increased permeability → Edema.
- Leukocyte recruitment and activation.
- Phagocytosis and killing of microbes.

CHEMICAL MEDIATORS

- Histamine, serotonin, prostaglandins, leukotrienes.
- Cytokines (IL-1, TNF), complement system.
- Derived from plasma or cells.

CHRONIC INFLAMMATION

- Prolonged duration with active inflammation, tissue destruction, and repair.
- Involves macrophages, lymphocytes, plasma cells.
- Can result in fibrosis and loss of function.

GRANULOMATOUS INFLAMMATION

- Distinctive pattern of chronic inflammation.
- Characterized by granuloma formation (macrophages, giant cells).
- Seen in tuberculosis, sarcoidosis, and some fungal infections.

MORPHOLOGIC PATTERNS

- Serous inflammation – thin fluid exudate.
- Fibrinous inflammation – fibrin deposition.
- Purulent (suppurative) inflammation – pus formation.
- Ulcerative inflammation – necrosis of mucosal surface.

TYPES OF INFLAMMATION



OUTCOMES OF INFLAMMATION

- Complete resolution.
- Healing by fibrosis.
- Progression to chronic inflammation.
- Complications: abscess, scarring.

ACUTE INFLAMMATION

- • Rapid onset (minutes to hours), short duration (few days).
- • Main cells: Neutrophils.
- • Features: Vasodilation, increased permeability, edema, and neutrophilic infiltration.
- • Example: Acute appendicitis, bacterial pneumonia.

SUBACUTE INFLAMMATION

- • Intermediate between acute and chronic inflammation.
- • Duration: several days to weeks.
- • Mixed cellular infiltrate (neutrophils, lymphocytes, macrophages).
- • Example: Subacute bacterial endocarditis.

CHRONIC INFLAMMATION

- • Prolonged inflammation (weeks to years).
- • Active inflammation, tissue destruction, and repair occur simultaneously.
- • Main cells: macrophages, lymphocytes, plasma cells, fibroblasts.
- • Examples: Tuberculosis, rheumatoid arthritis, chronic hepatitis.

CHRONIC INFLAMMATION

- • Prolonged inflammation (weeks to years).
- • Active inflammation, tissue destruction, and repair occur simultaneously.
- • Main cells: macrophages, lymphocytes, plasma cells, fibroblasts.
- • Examples: Tuberculosis, rheumatoid arthritis, chronic hepatitis.

GRANULOMATOUS INFLAMMATION

- • A distinct type of chronic inflammation characterized by granuloma formation.
- • Granuloma: collection of activated macrophages (epithelioid cells), giant cells, and lymphocytes.
- • Types:
 - - Caseating (e.g., Tuberculosis).
 - - Non-caseating (e.g., Sarcoidosis).

SPECIAL MORPHOLOGIC TYPES

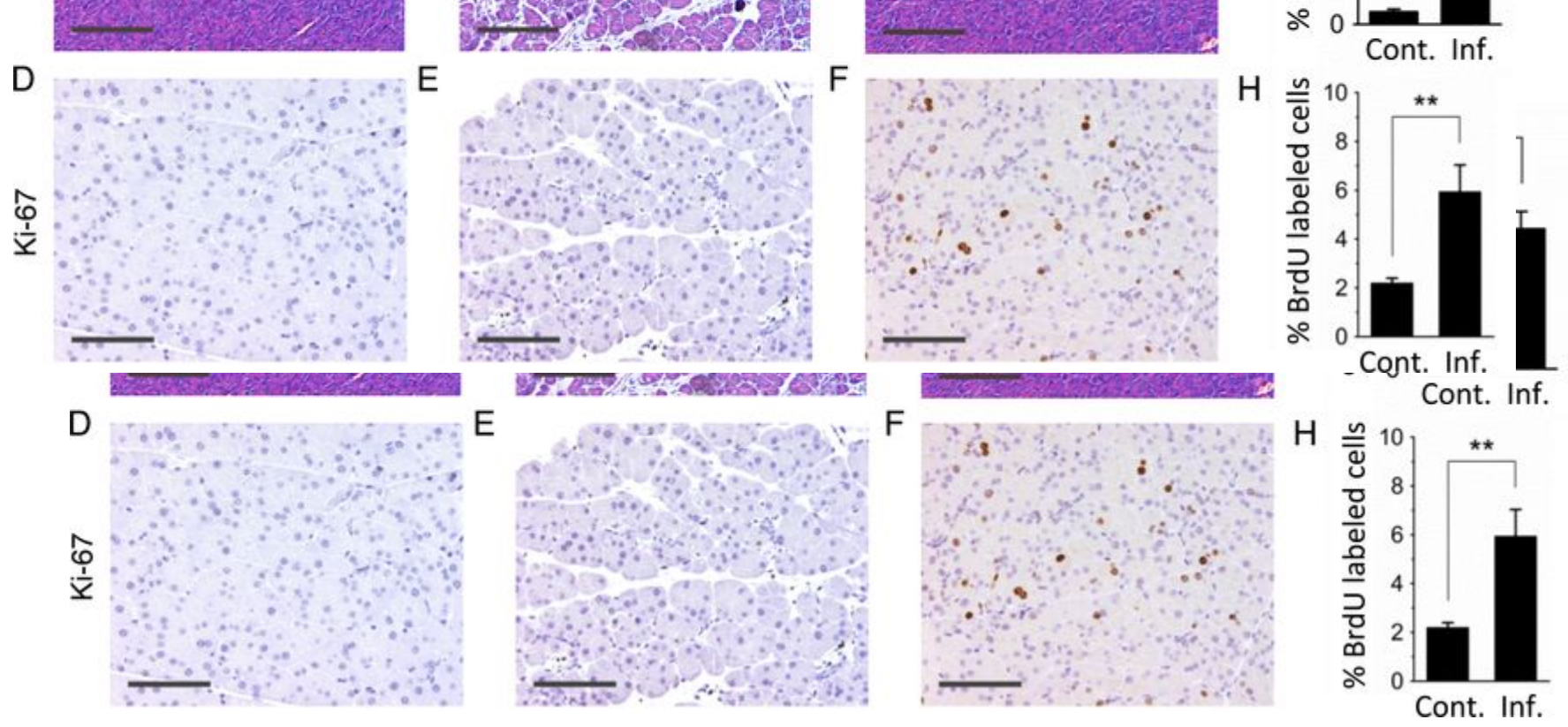
- 1. Serous Inflammation – thin, watery exudate (e.g., skin blister).
- 2. Fibrinous Inflammation – fibrin deposition (e.g., pericarditis).
- 3. Purulent (Suppurative) – pus formation (e.g., abscess).
- 4. Ulcerative Inflammation – necrosis of epithelium (e.g., peptic ulcer).
- 5. Catarrhal Inflammation – mucous hypersecretion (e.g., common cold).
- 6. Pseudomembranous – fibrin + necrotic debris (e.g., diphtheria).

COMPARISON TABLE

- Acute: short duration, neutrophils, edema, exudation.
- Subacute: mixed cells, partial healing and ongoing inflammation.
- Chronic: long duration, macrophages, fibrosis, tissue destruction.

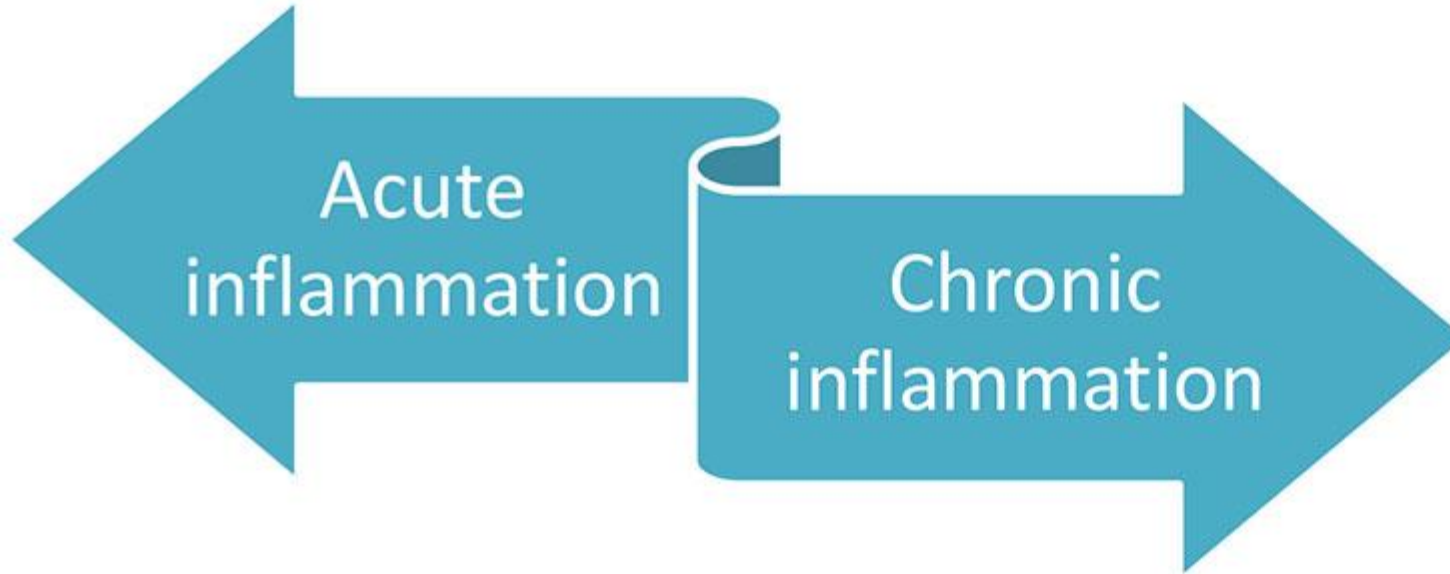
SUMMARY

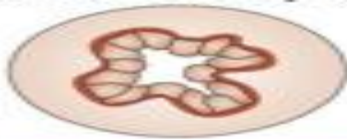
- Inflammation is a vital protective process.
- Acute and chronic inflammation differ in timing, cells, and outcomes.
- Balanced response is essential to prevent tissue damage.





TYPES





Antifibrotic strategies:

- Targeting TGF β
- PPAR γ agonists



Regeneration:

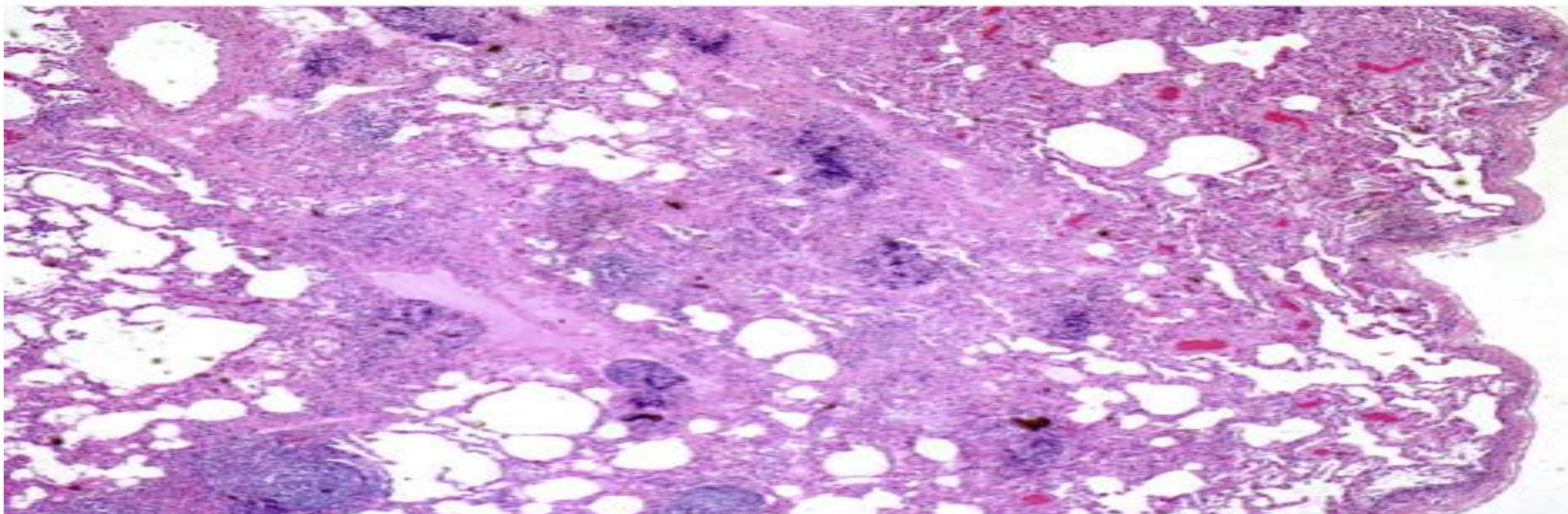
- Retinoic acid
- Stem cells

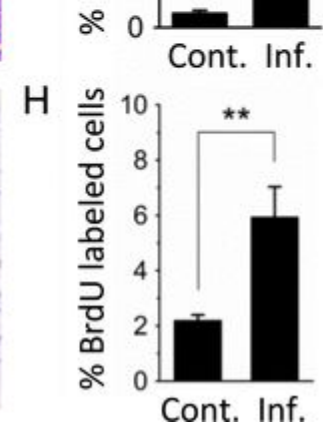
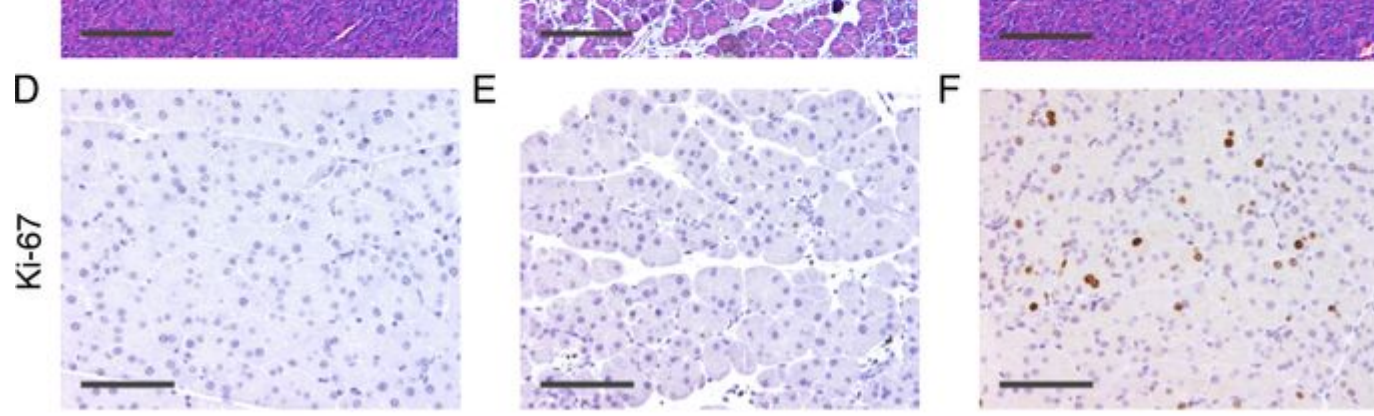


Mucoregulators:

- EGFR inhibitors

(B)





SUMMARY

- Inflammation is a vital protective process.
- Acute and chronic inflammation differ in timing, cells, and outcomes.
- Balanced response is essential to prevent tissue damage. Inflammation can be acute, subacute, or chronic based on duration and cellular composition.
- Special morphologic types provide insight into disease mechanisms.
- Understanding inflammation helps in diagnosis and therapy planning.

فيديو إضافي للاطلاع عبر الرابط

- Robbins & Cotran Pathologic Basis of Disease, 10th Edition.
- Kumar, Abbas, Aster. Basic Pathology.
- Open-access histology archives (NIH, Wikimedia Commons).

QUIZ



Any questions?

*Thank
You*