VIRAL HEPATITIS
CLINICAL SYNDROMES

1. ACUTE ASYMPTOMATIC INFECTION WITH RECOVERY
2. ACUTE SYMPTOMATIC INFECTION WITH RECOVERY
3. CHRONIC HEPATITIS WITH OR WITHOUT PROGRESSION TO CIRRHOSIS
4. ACUTE LIVER FAILURE WITH MASSIVE OR SUBMASSIVE HEPATIC NECROSIS.

1. CARRIER STATE :

   AN INDIVIDUAL WHO CAN TRANSMIT AN ORGANISMS BUT HAS NO SYMPTOM

   (A) HEALTHY CARRIER.

   (B) WITH CHRONIC HEPATITIS.

2. ACUTE HEPATITIS:

   (A) ICTERIC (B) ANICTERIC

3. CHRONIC HEPATITIS : BIOCHEMICAL, SYMPTOMATIC OR SEROLOGIC EVIDENCE OF HEPATIC DISEASE FOR MORE THAN 6 MONTHS.

- HAV & HEV PRODUCES SOLELY ACUTE HEPATITIS. ONLY IN O.1 % OF CASES ACUTE LIVER FAILURE.
- ALL OTHER HEPATOTROPIC VIRUSES ARE MORE UNPREDICTABLE CAPABLE OF INDUCING VARIOUS SYNDROME.
- IN CASE OF HBV & HCV INFECTION IMMUNE COMPLEX DISEASE IN FORM OF VASCULITIS, GLOMERULONEPHRITIS ETC. DEVELOP SECONDARY TO CIRCULATING AG-AB COMPLEX.

CARRIER STATE:

- A PERSON WITHOUT MANIFEST SYMPTOMS HARBOURS AND CAN TRANSMIT ORGANISM.
- VIROLOGIC OR SEROLOGIC MARKERS OF INFECTION ARE PRESENT.
- 1.HEALTHY CARRIER. HARBOUR ONE OF THE VIRUSES BUT NOT SUFFERING FROM DISEASE OR NO ADVERSE EFFECT.
- 2.CARRIER WITH CHRONIC HEPATITIS WITH MILD SYMPTOMS.
- BOTH CONSTITUTE RESERVOIR OF INFECTION.

- CLINICAL RECOGNITION OF CARRIER IMPORTANT PARTICULARLY IN DONOR SELECTION.
- HBV -- HBSAG TEST ROUTINELY DONE.
- IDENTIFICATION OF HDV IN HBV CARRIER BY DEMONSTRATION OF ANTI-HD.

RISK OF CARRIER STATE DEVELOPMENT

- THOSE WITH IMPAIRED IMMUNE RESPONSE.
- PTS. ON IMMUNOSUPPRESSIVE THERAPY.
- PTS. RECEIVED MULTIPLE TRANSFUSION OR HEMODIALYSIS OR IN DRUG ADDICTS.
- AGE OF PT. AT THE TIME OF INFECTION.
- INFECTION EARLY IN LIFE AS BY VERTICAL TRANSMISSION FROM MOTHER TO OFFSPRING 90 TO 95% PRODUCES CARRIER STATE.

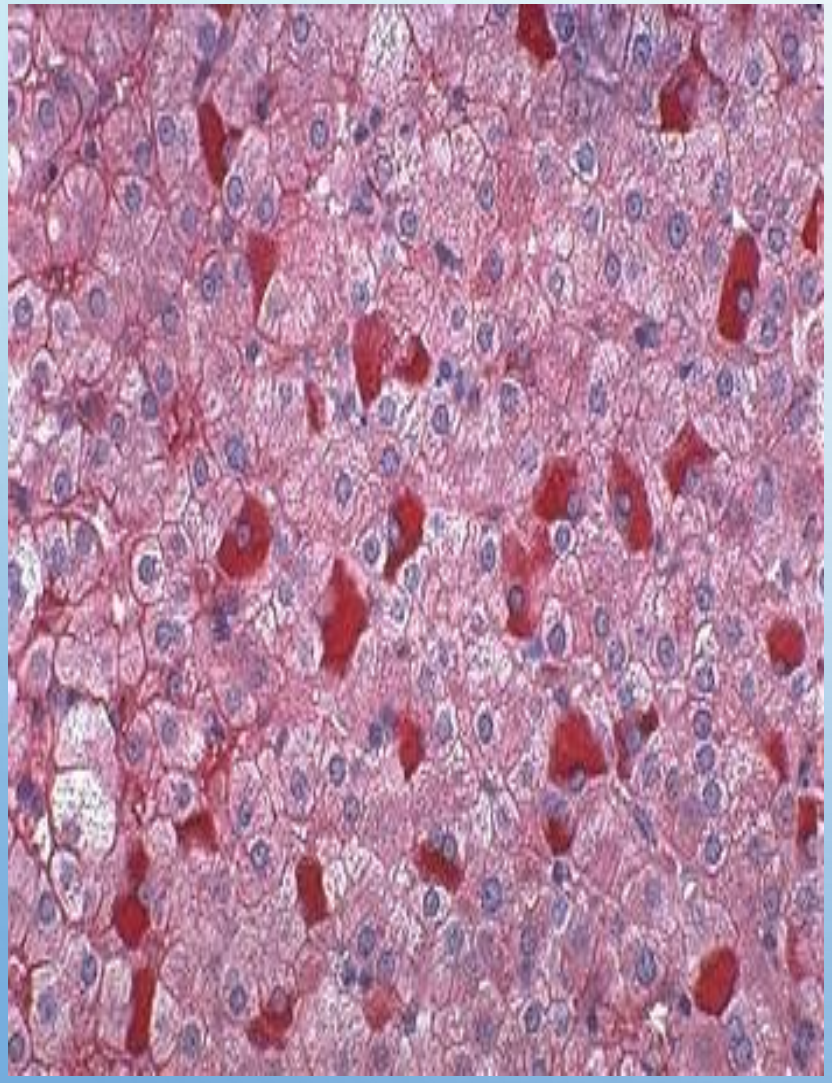
MORPHOLOGY

- HBV CARRIER STATE HAVE DISTINCTIVE MORPHOLOGY.
- HEALTHY CARRIER--
- LIVER ARCHITECTURE IS NORMAL.
- ISOLATED OR SMALL GROUP OF CELLS HAVE

  (1) GROUND GLASS FINELY GRANULAR EOSINOPHILIC CYTOPLASM. E\M SPHERE & TUBULES OF HBsAG.

  (2) SANDED NUCLEI- STUFFED WITH HBcAG.

CARRIER STATE HBV

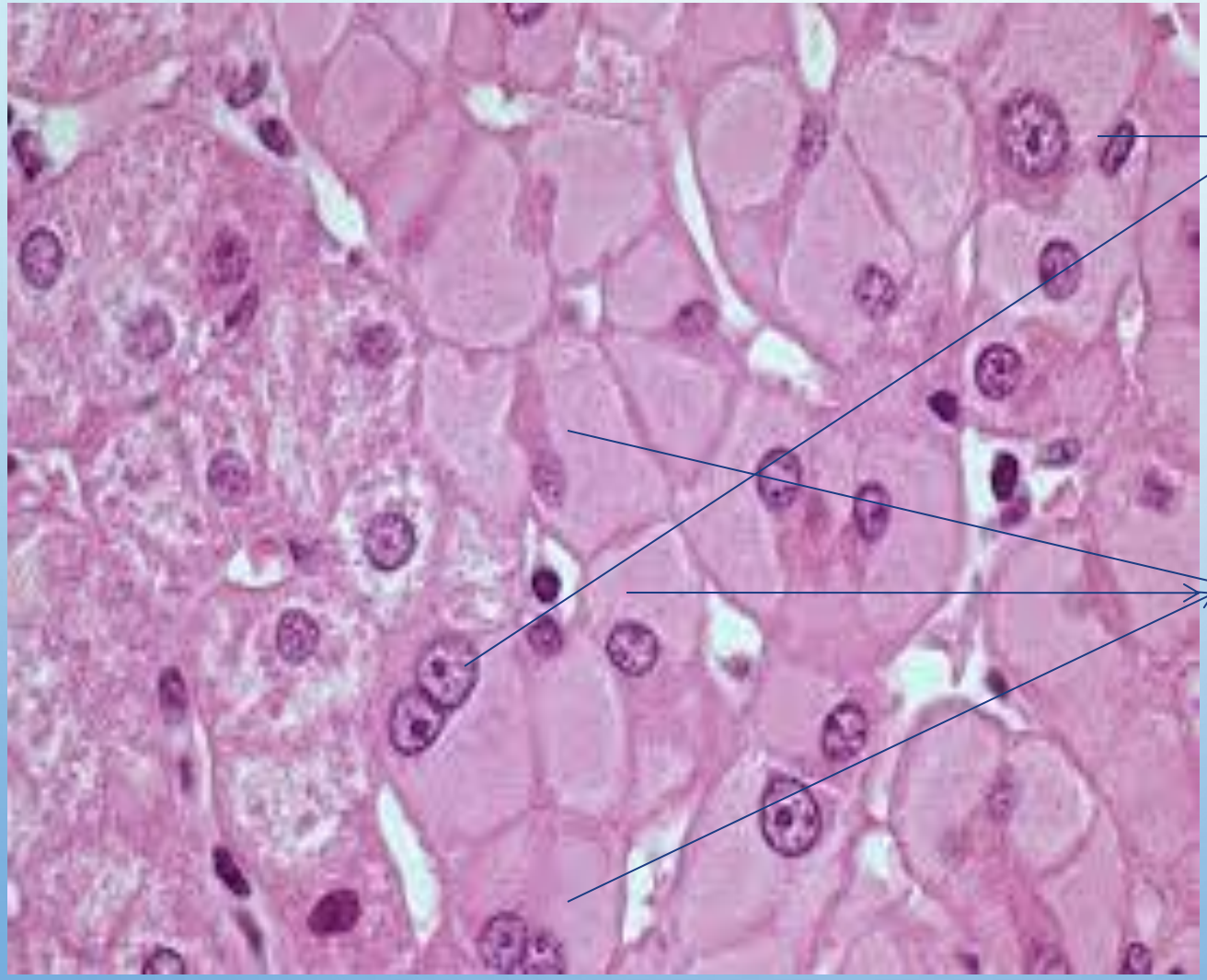


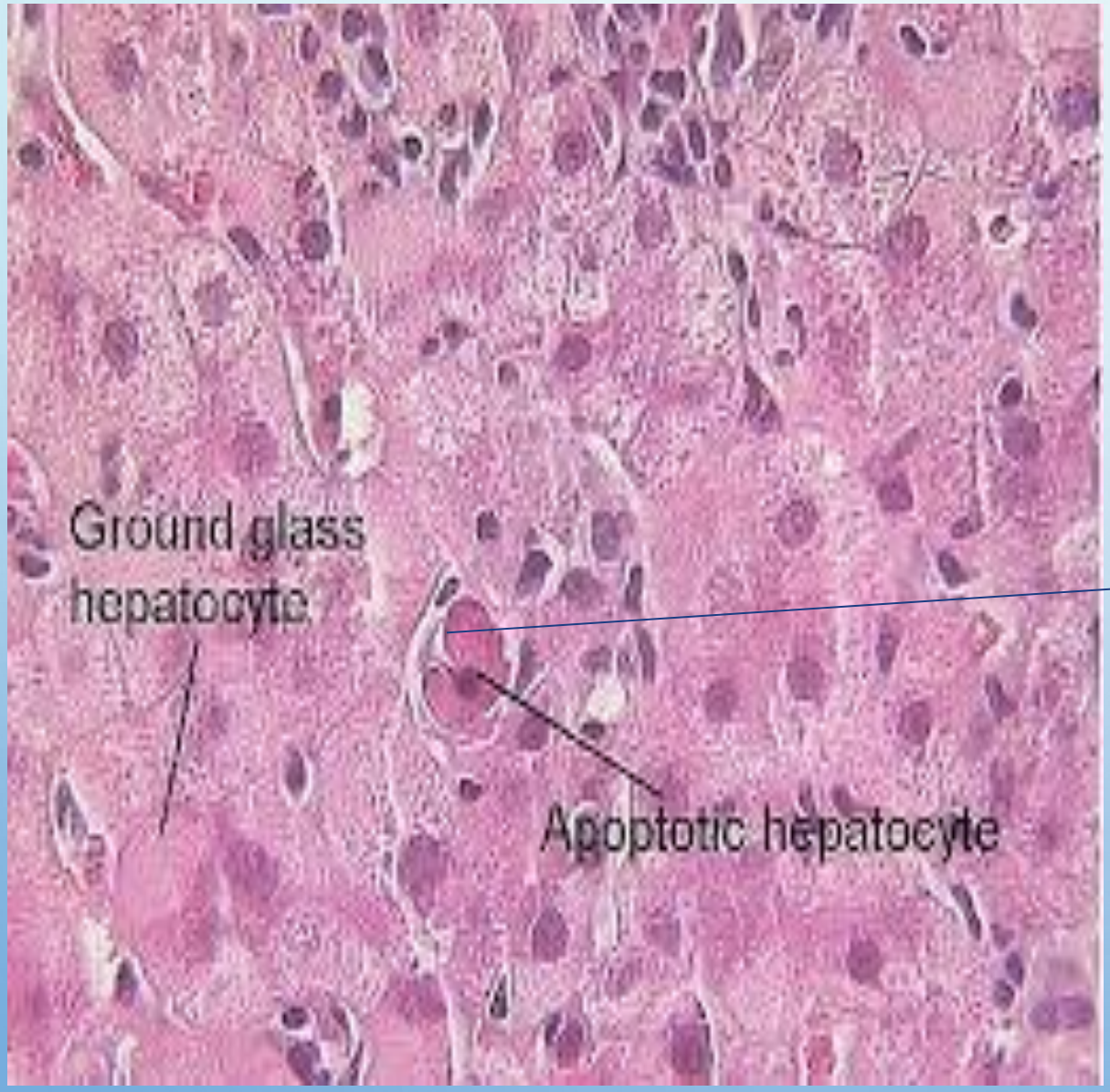
- THIS IS AN IMMUNOHISTOCHEMICAL STAIN FOR HBsAG IN A SECTION OF LIVER FROM A PATIENT WHO IS A HEPATITIS B CARRIER. THE "GROUND-GLASS" HEPATOCYTES, WHICH ARE LADEN WITH HBsAG, STAIN DARK RED.

IN CARRIER WITH CHRONIC HEPATITIS

- HISTOLOGIC EVIDENCE OF LIVER CELL INJURY.
  I.E. CELLULAR SWELLING.
- PORTAL MONONUCLEAR INFLAMMATION.
- GROUND GLASS CYTOPLASM.
- SANDED NUCLEI.
- THEY HAVE INCRESED RISK OF
  DEVELOPPING CARCINOMA.

HEPATITIS B :





Apoptic hepatocytes (councilman bodies)

ACUTE VIRAL HEPATITIS

- CAUSED BY ANY HEPATOTROPIC VIRUS.

  DISEASE IS DIVIDED IN FOUR PHASES.

  (1) INCUBATION PERIOD.

  (2) SYMPTOMATIC PRE-ICTERIC PHASE.

  (3) SYMPTOMATIC ICTERIC PHASE.

  (4) CONVALESCENCE.

INCUBATION PERIOD :

- HAV 2 TO 6 WEEKS
- HBV 2 TO 26 WEEKS
- HCV 4 TO 26 WEEKS
- HDV 2 TO 26 WEEKS
- HEV 4 TO 5 WEEKS

PRE-ICTERIC PHASE

- NONSPECIFIC SYMPTOMS LIKE MALAISE, NAUSEA , ANOREXIA ,WT. LOSS , LOW GRADE FEVER, HEADACHE , MUSCLE & JOINT PAIN.
- INCREASED SERUM LEVEL OF ,
- SGOT(AST) –ASPARTATE AMINOTRASFERASE
- SGPT(ALT) -ALANINE AMINO TRANSFERASE
- LDH.

ICTERIC PHASE---JAUNDICE

- CONJUGATED HYPERBILIRUBINEMIA.
- URINE TURN DARKER (BIRUBINURIA).
- STOOL BECOMES LIGHTER–DUE TO SWOLLEN

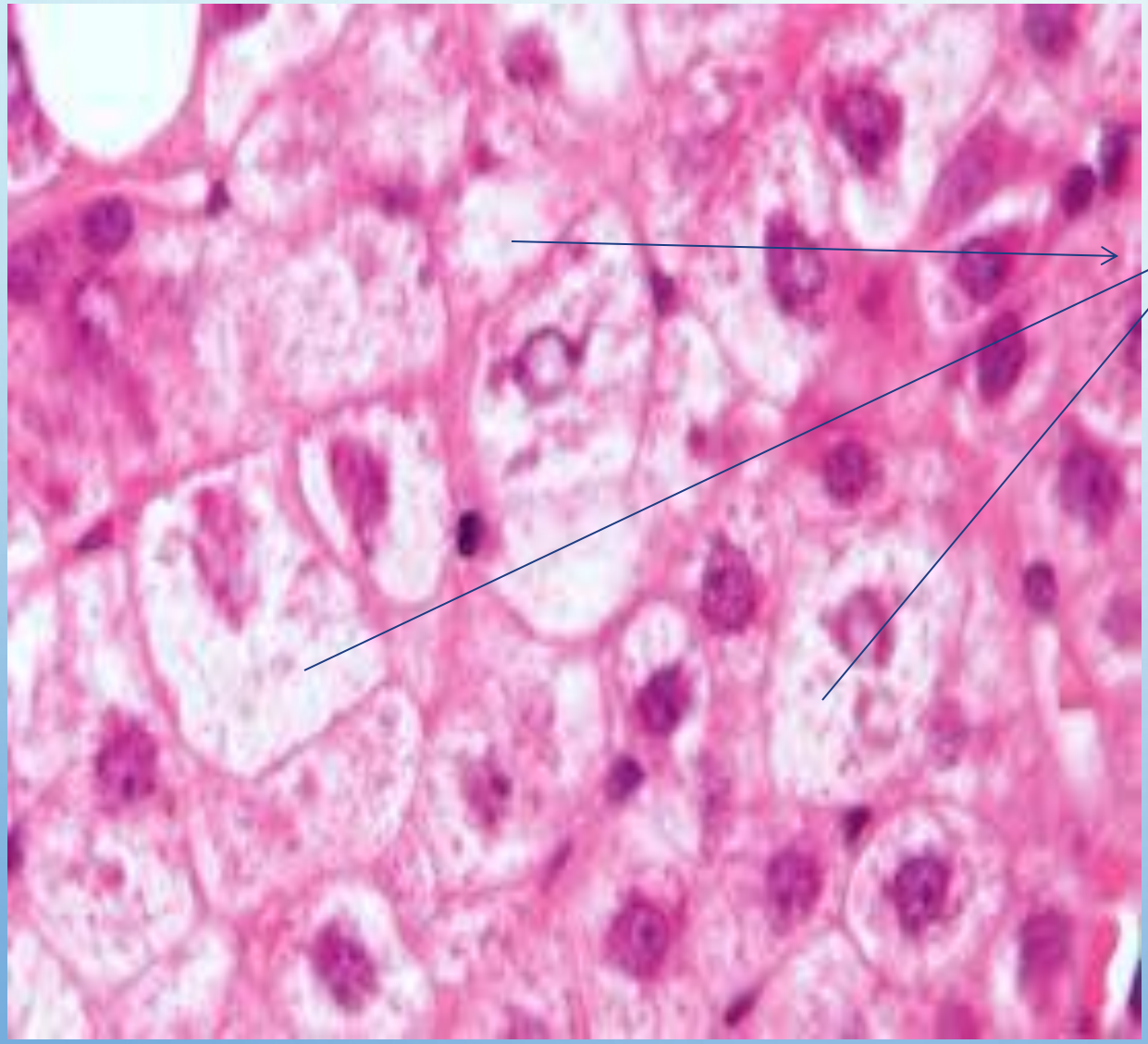
  HEPATOCYTES OBSTRUCT FLOW OF BILE THRO' BILIARY CANALICULI. (CHOLESTASIS)
- DISTRESSING ITCHING (RETENTION OF BILE SALT)
- LIVER MILDLY ENLARGED & TENDER.
- WITH ONSET OF JAUNDICE CONSTITUTIONAL SYMPTOMS BEGINS TO CLEAR.
- PTS. FEEL BETTER.

COVALESCENCE :

- MOST OF SYMPTOMS CLEAR AS CONVALESCENCE BEGINS.
- LAB. INVESTIGATION.
- INCREASE SERUM BILIRUBIN.
- INCREASE SGOT,SGPT,LDH.
- PROLONGED PROTHROMBIN TIME.
- HYPERGLOBULINEMIA.
- SEROLOGICAL MARKERS.

MORPHOLOGY

- DIFFUSE LIVER CELL INJURY WITH LOBULAR DISARRAY.
- SWELLING OF HEPATOCYTES.
- BALLOONING DEGENERATION.
- NECROSIS OF RANDOM ISOLATED HEPATOCYTE OR SMALL CLUSTERS OF CELLS.(PIECEMEAL NECROSIS)
- CELL DEATH BY APOPTOSIS.
- DEAD CELL ACIDOPHILLIC BODY – COUNCILMAN BODY. PHAGOCYTOSIS BY MACROPHAGES.
- REACTIVE CHANGES IN KUPFFER CELLS & SINUSOIDAL LINING CELLS.
- INFLAMMATORY INFILTRATE IN PORTAL TRACTS.(MILD)
- RECOVERY PHASE-HEPATOCYTIC REGENERATION.
- NO GROUND GLASS OR SANDED NUCLEI .



Ballooning degeneration of hepatocytes

CHRONIC HEPATITIS

- SYMPTOMATIC, BIOCHEMICAL OR SEROLOGIC EVIDENCE OF CONTINUING OR RELAPSING INFLAMMATORY HEPATIC DISEASE FOR MORE THAN 6 MONTHS.
- TYPES :

  (A)CHRONIC HEPATITIS WITHOUT PROGRESSION TO CIRRHOSIS.

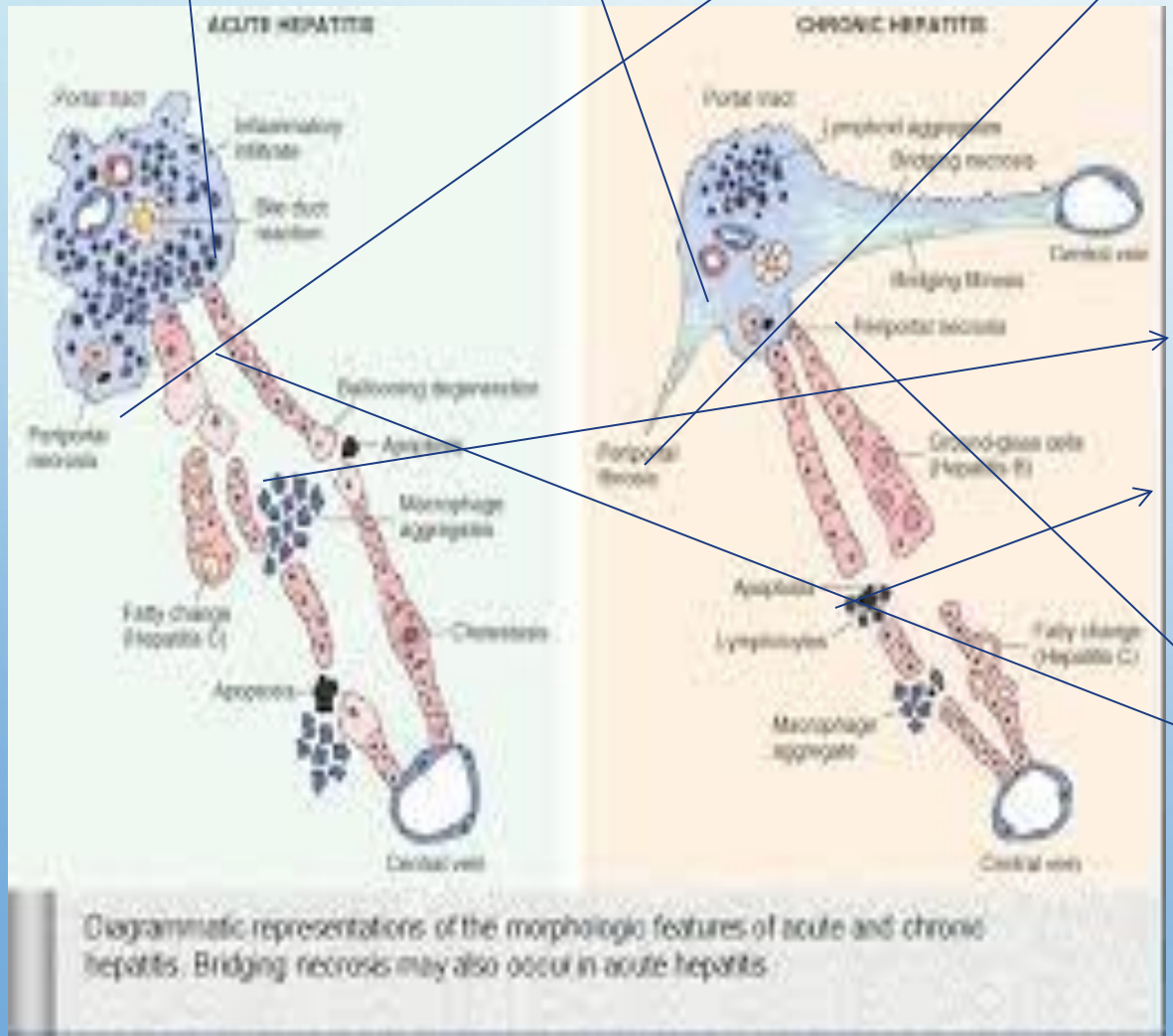
  (B)CHRONIC HEPATITIS WITH PROGRESSION TO CIRRHOSIS.
- INADEQUATE IMMUNE RESPONSE FAILS TO CONTROL CONTINUED HBV REPLICATION-LEADS TO CHRONIC HEPATITIS.

1.Scant inflammation

1.Dense inflammation

2.No fibrosis

2.Portal fiibrosis



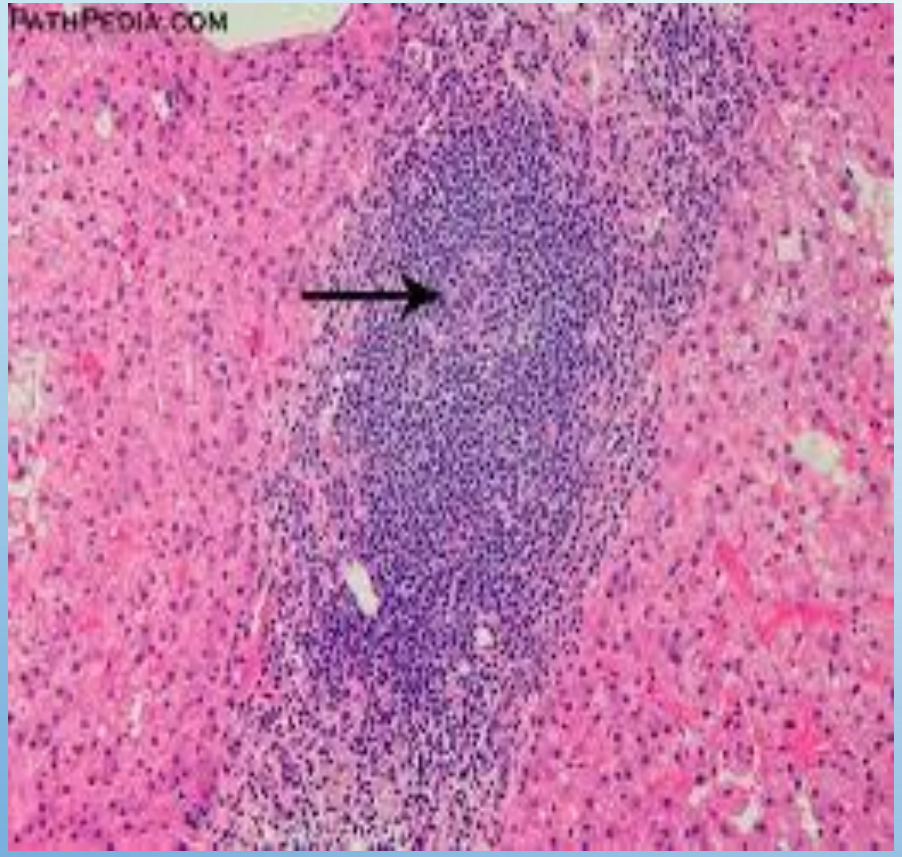
Diagrammatic representations of the morphologic features of acute and chronic hepatitis. Bridging necrosis may also occur in acute hepatitis

3.Balloning degeneration

3.Ground glass cells

4.Bridging necrosis

4.No bridging necrosis

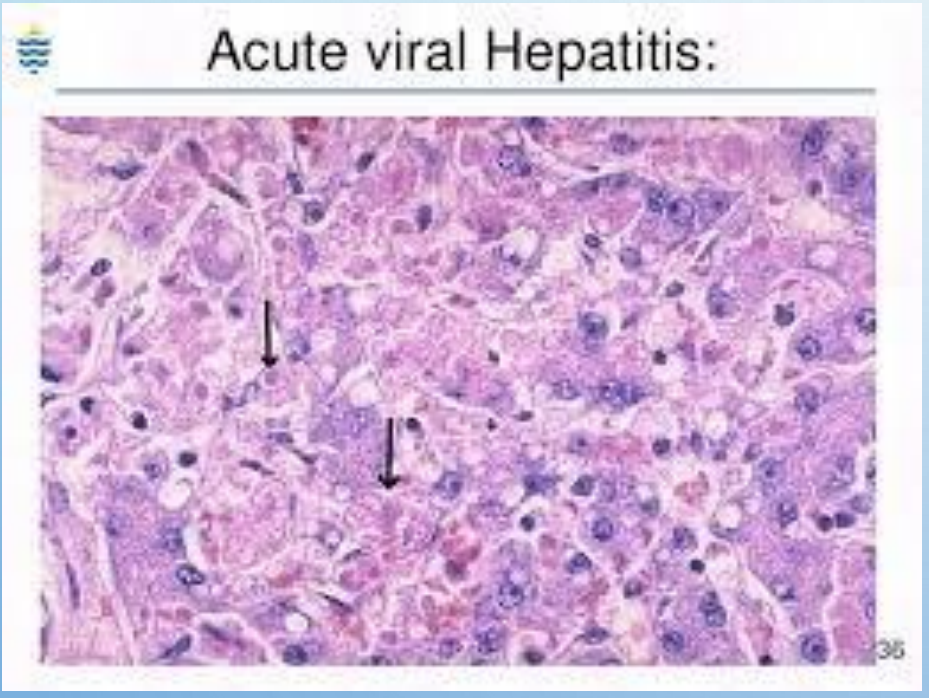


- THIS IMAGE OF LIVER IS FROM A PATIENT WITH CHRONIC HEPATITIS C VIRUS INFECTION. PORTAL INFLAMMATORY INFILTRATES IN CHRONIC HEPATITIS C VIRAL INFECTIONS FREQUENTLY CONTAIN LYMPHOID AGGREGATES OR LYMPHOID FOLLICLES. STEATOSIS IS ALSO PRESENT IN HCV INFECTIONS, IN CONTRAST TO HBV INFECTION.

COMPARISION OF INFLAMMATORY CELL DENSITY

ACUTE HEPATITIS

CHRONIC HEPATITIS



CHRONIC HEPATITIS WITHOUT PROGRESSION :

- RELAPSING , REMITTING, SELF LIMITED.
- NOT ASSOCIATED WITH PROGRESSIVE LIVER DAMAGE.
- MAY TAKE AS LONG AS SEVERAL YEARS TO CLEAR.
- PTS. SYMPTOMS FREE OR MILD SYMPTOMS.
- ELEVATED SERUM LEVEL OF AMINOTRANSFERASE.

MORPHOLOGY :

- MILD MORPHOLOGIC CHANGES.
- NOT PATHOGNOMIC.
- CHRONIC TRIADITIS.
- INFLAMMATORY INFILTRATE IN PORTAL TRACTS, INFILTERATE DO NOT SPILL OUT IN TO HEPATIC PARENCHYMA.
- LIVER ARCHITECTURE IS WELL PRESERVED.
- ABSENCE OF PIECEMEAL NECROSIS OR BRIDGING NECROSIS.

CHRONIC HEPATITIS WITH PROGRESSION :

- CHRONIC NECROTIZING & FIBROSING HEPATIC DISEASE OF VARIED ETIOLOGY.
- IT IS SERIOUS PROGRESSIVE DISORDER.
- ETIOLOGY.

  (1) VIRAL - HBV, HBV-HDV, HCV.

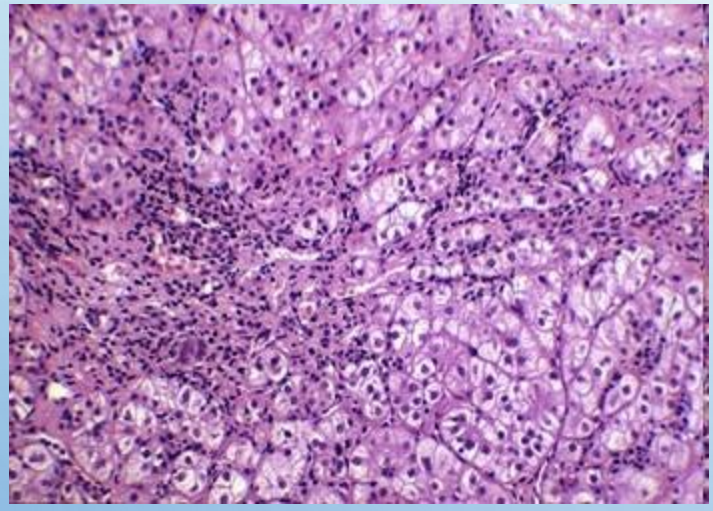
  (2) DRUGS LIKE OXYPHENACETIN, METHYLDOPA, ISONIAZID.

  (3) AUTOIMMUNE REACTION (LUPOID HEPATITIS)

MORPHOLOGY

- EXUBERANT PORTAL INFLAM. INFITERATE-SPILL OUT OF PORTAL TRACT.
- PIECEMEAL NECROSIS.
- BRIDGING NECROSIS.
- BILE STASIS IN HEPATOCYTES & CANALICULI.
- PROGRESSIVE FIBROSIS.
- HEPATOCYTIC REGENERATION.
- KUPFFER CELL HYPERTROPHY HYPERPLASIA.
- LYMPHOID AGGREGATES IN PORTAL TRACT– IN HCV INFECTION.

HISTOPATHOLOGY



- CHRONIC INFLAMMATORY INFILTRATE IN THE PORTAL AREAS OF THE LIVER THAT EXTENDS BEYOND THE PORTAL AREA INTO THE ADJACENT LOBULE, WHERE IT ENCIRCLES HEPATOCYTES, MANY OF WHICH ARE UNDERGOING DEGENERATION AND NECROSIS. THIS IS THE MORPHOLOGIC CORRELATE OF PROGRESSIVE ACTIVE LIVER DAMAGE THAT IS PRESENT IN SOME PATIENTS WITH CHRONIC VIRAL HEPATITIS.

LAB. DIAGNOSIS :

- INCREASE SERUM TRANSAMINASES.
- PROLONGATION OF PROTHROMBIN TIME.
- HYPERGLOBULINEMIA.
- HYPERBILIRUBINEMIA.

CLINICAL COURSE :

- UNPREDICTABLE.
- SIGNS & SYMPTOMS OF LIVER DISEASE.
- SOME PTS. HAVE RAPIDLY PROGRESSIVE DISEASE.
- CIRRHOSIS DEVELOP WITHIN A FEW YEARS.

MAJOR CAUSE OF DEATH

- LIVER FAILURE.
- HEPATIC ENCEPHALOPATHY.
- CIRRHOSIS WITH MASSIVE HEMATEMESIS FROM ESOPHAGEAL VARICES.
- HEPATOCELLULAR CARCINOMA.

SUBMASSIVE TO MASSIVE NECROSIS. (FULMINANT HEPATITIS)

- ACUTE LIVER FAILURE IS DEFINED AS AN ACUTE LIVER ILLNESS ASSOCIATED WITH ENCEPHALOPATHY & COAGULOPATHY WHICH OCCURS WITHIN 26 WEEKS OF INITIAL LIVER INJURY IN THE ABSENCE OF PRE-EXISTING LIVER DISEASE.
- CAUSES.
  (1) HBV, HCV, HDV.
  (2) CHEMICALS & DRUGS. E.G. HALOTHANE, CHLOROFORM, CARBON TETRACHLORIDE, METHYLDOPA & ISONIAZID.

(3) ACUTE FATTY LIVER OF PREGNANCY.

(4) ISCHEMIC NECROSIS.

(5) WILSON DISEASE.

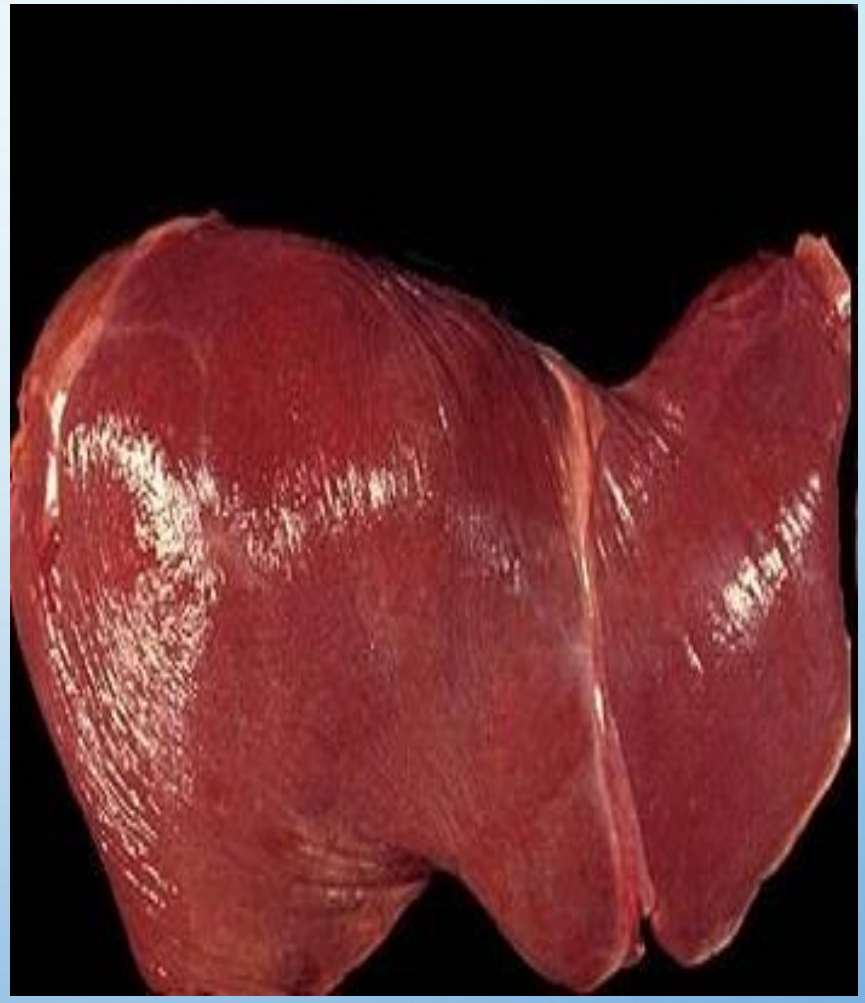
SEVERITY DEPENDS UPON,

- PT.'S AGE
- PREVIOUS CONDITION OF LIVER.
- STRENGTH OF IMMUNE RESPONSE. STRONGER THE IMMUNE RESPONSE -STRONGER IMMUNOLOGIC REACTION-- GREATER THE DESTRUCTION.

MORPHOLOGY :

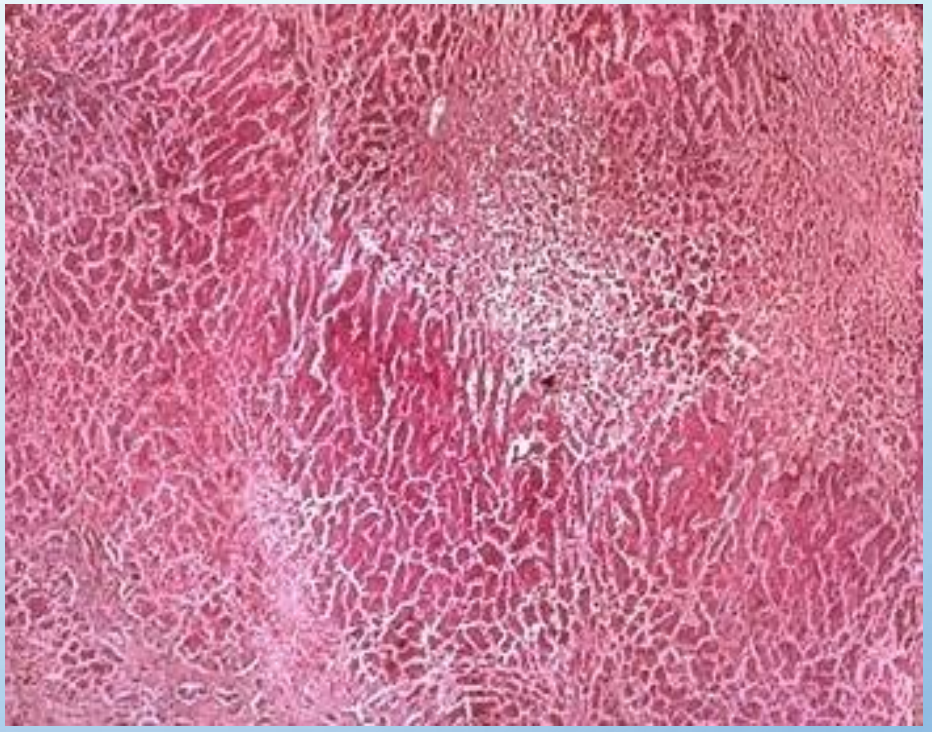
- ENTIRE LIVER MAY BE INVOLVED.
- SOMETIME RANDOM AREAS OR PATCHY LARGE AREAS MAY BE DISPERSED HAPHAZARDLY THROUGHOUT THE LIVER.
- DECREASE IN SIZE OF LIVER.
- DECREASE IN WT. OF LIVER 500 TO 700 GMS.
- LIVER TRANSFORMED IN RED LIMP ORGAN COVERED BY TOO LARGE CAPSULE.
- BLOTCHY GREEN BILE STAINING.

- IN FULMINANT HEPATITIS FROM ANY CAUSE, THE LIVER IS SMALLER THAN NORMAL, DUE TO EXTENSIVE AREAS OF LIVER NECROSIS. THE LIVER IS ALSO SOFT WITH A WRINKLED CAPSULAR SURFACE.



HISTOPATHOLOGY OF FULMINANT HEPATITIS

- THERE IS MASSIVE NECROSIS OF HEPATOCYTES THROUGHOUT THE LOBULES



HISTOLOGY

- NECROSIS MAY WIPE OUT ENTIRE LOBULE.
- IF LESS EXTREME-DESTROYING CENTRAL & MIDZONAL REGION.
- LIQUEFACTION OF HEPATOCYTES.
- SHRINKAGE OF LIVER.
- RETICULAR FRAMEWORK MORE CONDENSED PORTAL TRACTS APPEAR TO CONVERGE.
- FEW INFLAMMATORY CELLS IN PORTAL TRACT .