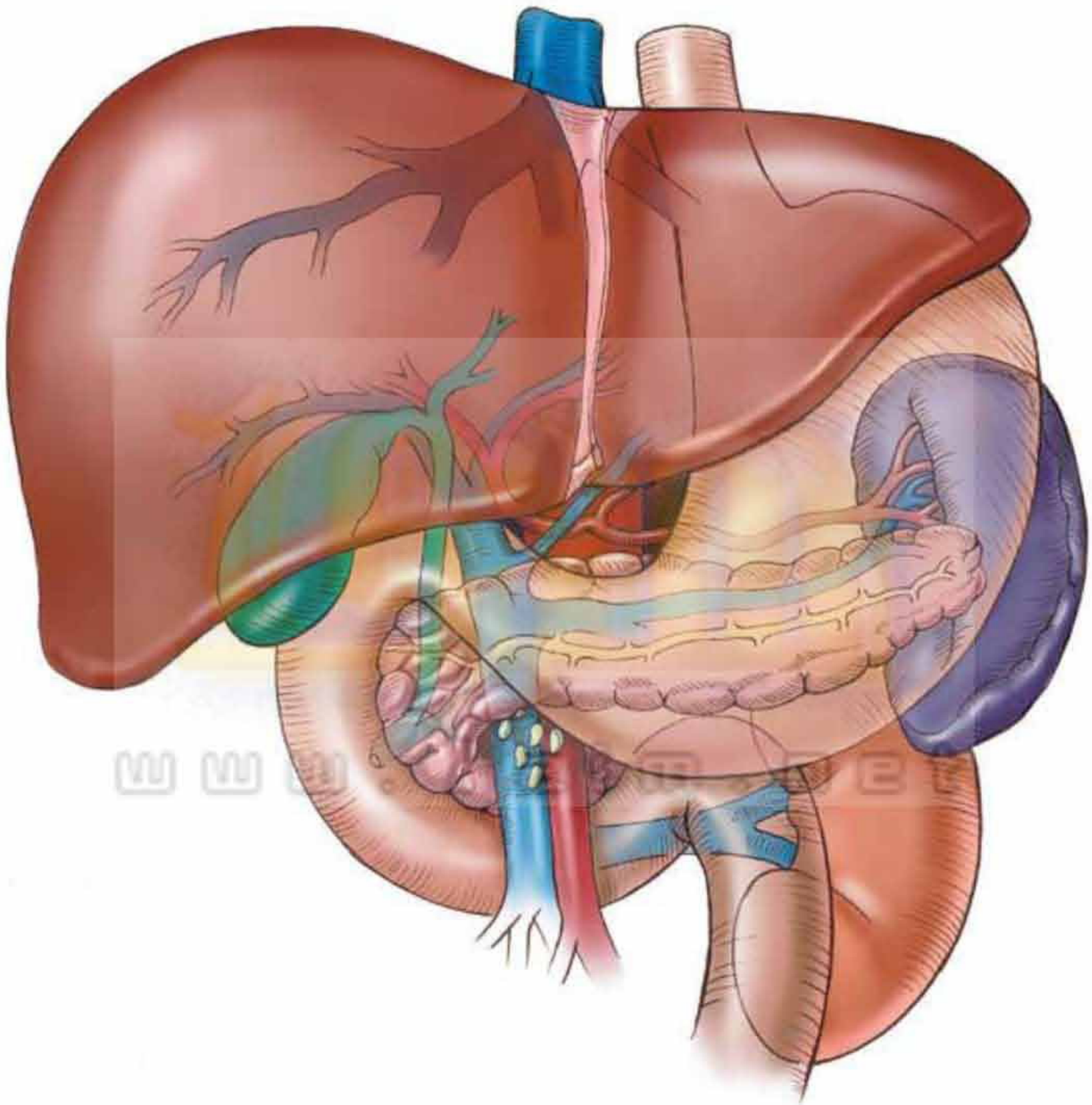
LIVER



2009-2010

Index:

- Acute hepatitis.
- Chronic hepatitis.
- Cirrhosis.
- LCF.
- Hepatic Encephalopathy.
- Portal HTN.
- Ascites.
- Hepatoma.

Viral Hepatitis

"Inflam. Of the liver parenchyma at Cons."

causes of Acute Viral Hepatitis

Hepato-tropic	Non-Hepato-tropic
• A-B-C • D G E • F G ?!	• EBV • HSV • CMV

	HAV	HBV	HCV
• Type of Virus	RNA "Picorna = Entero"	DNA	RNA
• MOT	• Feco-oral. (Virus appears in stools 2 wks. before onset of the S.P & 1 wk after)	• Blood borne **Tech. risk, drug abusers, infected tools** • Parentral. • Trans-placental. • **Sexual** / Saliva.	• Blood transf. **Tech. risk** • Parentral.
• IP	2-6 **wks.**	2-6 **ms.**	7-8 wks.
• Age	Child	Adult	Adult
➢ **Immune-Response**			
1) Resolution	✓ (it is the rule)	✓ Good immune response (clearance of virus)	✗
2) Carrier	✗	✓ Poor immune response esp. to HBV (can't recognize virus)	?!
3) Chronicity	✗	✓ Better immune response 5 % (causing damage of hepatocyte)	✓ 50% Chronicity is the rule. (Cytopathic)
4) Fulmination	✓ (0.5%)	✓	
➢ Malignancy	✗	✓	✓ 4 times >> HBV

➢ Markers of Viral hepatitis

HAV Markers

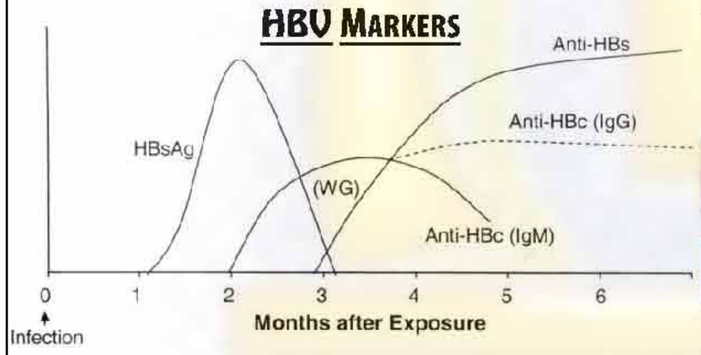
HA - Ab

- +ve IgM ⇒ Recent infection.
- +ve IgG ⇒ Past infection. (No Chronicity)

"common in population >50 ys."

E/M ⇒ Viral particles.

HBV Markers



HBV Markers "Dane particle"

Surface

HBs Ag

appears → v. early b4 ↑ transam.

Disapp. → < 6ms. after infection

1) Infection with HBV but since when?! So we do c Ab.
2) +ve s Ag < 6 ms. → Acute Hepatitis.
   > 6ms. → Chronic Hepatitis

+ve s Ag with
- Normal enzymes → Carrier or Recent Inf.
- ↑ Enzymes
  - Mild ↑ → Chronic Hepatitis
  - Marked ↑ → Acute Hepatitis

HBs Ab

appear → 3 – 4 ms

persists → ys.

Immunity so no vaccine needed"

- IgM — Recent inf.
- IgG — Old inf.

HB sAb
- Alone → post. Vaccine
- with cIgG → past infection e Immunity

Core

HBc Ab

بطلع بسرعة
و بختفي بسرعة

c IgM is +ve in WC (if -ve sAg & sAb)

c IgM is the only marker for Recent HBV Infection bec. we can't know since when sAg & sAb were +ve !!

HB cAb
- HB c IgM → Recent Inf.
- HB c IgG → past infection

e

HBe Ag

⇓ Active Viral replication

⇓ High infectivity (acute r ch.)

Viral mutation may occur or induced by Interferon

→ so replication is detected by DNA "PCR" → so pt. can be infected e HBV with (- ve) e Ag.

HBe Ab

⇓ Conv.

⇓ Low infectivity

HCV Markers

HCV Ab

⇓ +ve ELISA (Screening)

⇓ +ve RIBA (Confirmatory)

⇓ Infection but doesn't indicate Immunity ?!!!

⇓ ملوش معنى ... مقدرش أعرف منه مناعته!

so we do PCR

Viral RNA

⇓ PCR (Diagnostic)

⇓ Quantitative mandatory

➢ Prophylaxis

	HA Vaccine	HA IG
	- Inactivated.	Sero-prev. / attenuation.
Dose	- 1mm then booster dose at 6-12 mns.	e in 6 days of exposure
Validity	- 10 ys.	3-6 ms.
Indic.	1) Chronic LD. 2) Travelers to endemic.	1) Contact "recent exposure e in 6 days" 2) Travelers for short duration "3-6 ms".

HB Vaccine

- Recombinant DNA.
- IM (0,1,6)
- Check vaccine ⇒ measure HBs Ab at 7-9 ms after the initial dose.
- Indications:
  - A) HCW.
  - B) HD patients. (Double the Dose dr ↓ immunity)
  - C) Newborn of HB sAg mothers.
  - D) Sexual partners of HB sAg.

HB IG

HB sAb

- Recent exposure to infected BL.

(given not exceeding 1 wk.)

No Vaccine

Acute - Viral Hepatitis

- **DEF.:** Acute inflam. of liver parenchyma < 6ms.
- **CCC. by:**
  - **A) PT INFILTRATION.**
  - **B) SWELLING OF HEPATOCYTES.**
    - ⇒ NARROWING OF THE BILE CANALICULI.
    - ⇒ INTRA-HEPATIC CHOLASTASIS.
  - **C) CENTRAL NECROSIS. (ZONE 3)**

NON – ICTERIC HEPATITIS

- Flu – like ...
- Nausea- anorexia.

MILD Hepatitis

- ↑ S. BILIRUBIN < 2.5MG (No Jaundice ,,so pass un-noticed.)
- ↑ SGPT. (SPECIFIC / SENSITIVE)

FATE ?!

- RESOLUTION
- CHRONIC H. ESP. HCV ⇩ CIRRHOSIS?!

ICTERIC HEPATITIS

	PRE-ICTERIC "VIREMIA FOR 1-2 WKS"	ICTERIC "FEVER ↓ JAUNDICE FOR 3-6 WKS"	POST – ICTERIC "CONVALESCENCE"
➢ **CI./P**	1) F A H M dt...viremia. (severe Anorexia → distaste) 2) Pain IN RT. HYPO-CHONDRIUM.	1) ↓ F A H M SUBSIDES. ⇩ THEN 2) Cholestatic Jaundice dt... swelling of hepatocytes sclera olive-green J: Dark urine "bilirubinuria" / Clay stool "bec. bilirubin doesn't reach intestine".	Good GC. < 6ms. ⇩ CLINICALLY & BIO FREE > 6ms. ⇩ CHRONIC HEAPTITIS
➢ **INVEST.**	• ↑ SGPT "IF SUSPECTED" BEC. IT'S SPECIFIC & SENSITIVE"	↑ SGOT / BILIRUBIN. • LIVER ⇒ ++ & TENDER. (dt STRETCH of CAPSULE) • SPLEEN ⇒ JUST palpable dt RES++ (DD "PITH SPLEEN ... SE NBs")	↓ SGOT / ↓ S. BILIRUBIN "but Jaundice persists dt ↑ affinity of bilirubin to collagen in sclera → so we depend on s. Bilirubin not depth of Jaundice"

➢ Complications of Acute - Viral Hepatitis

1) يطول و يقصر
2) يقلب و يحور

Hepatic

Prolonged Cholestasis
"dt Un-resolved swelling of hepatocytes especially in HAV"

- Normal Transaminases
  - ↑ ALP (SGPT)
  - ↑ Billirubin
- Re-assure. spont. recovery ± Steroids?!

Fulminant H.
- LCF
- Encephalopathy (↑↑↑ PT)

Chronic H.
"persistent ↑ Enzymes > 6 ms."

- Cirrhosis ?!
- HCC

Resolution then...

- Relapse
  "dt pre-mature activity"
  - Reassure. spont. recovery
- Post Hepatitis $
  - Normal Enzymes
  - DT Psychogenic not Liver D.
    - Re-assure & Follow up.

Extra-Hepatic
"mainly with HBV & HCV due to IC"

1) Aplastic An. ⇒ pan-cytopenia.
2) Arthritis.
3) GN → Membranous GN. (HBV) / MPGN due to Cryo-gb (HCV)
   (Interferon + Steroids for GN)
4) Vasculitis. PAN dt persistent HBs Ag in Chronic or Carrier.
5) Lichen planus. "HCV"

Gilbert $ (AD)
"defective uptake of I. bilirubin"
→ Un-cong. Hyper-bilirubinemia
(↑ I. Bilirubin only with N Hb & Liver E.)
"Falsely discovered during follow up of viral hepatitis"

special ccc. of Acute - V. Hepatitis o
1) HAV ⇒ prolonged cholestasis.
2) HBV ⇒ more severe than A ± serum sickness like $
3) HCV ⇒ Asymptomatic "diagnosed v. late"

Investigations for Acute Viral Hepatitis

Urine
"Bed side test"

- **D. Bilirubinuria** ⇓ "early sign dt cholestasis ↓ ↓conjugation"
- **Uro-bilnogen**
  - **-ve in urine early dt** — Marked obst.
  - **+ve in urine late dt** — Relieve of obst.

To prove Hepatitis

- **↑↑↑ SGOT – SGPT** (Marked ↑ upto 100 -1000 folds)
- **↑ALP & γ GT.** (mild dt parench d.)

NB:
- Hepatitis (↑ Trans-Am. > ALP)
- Cholestasis (↑ ALP > Trans-Am.)

Liver Functions

- **S. Albumin** (long ½ life) ⇓ **Normal** (bec. it is Acute D.)
- **PT** (short ½ life)
  - **If Normal** ⇓ Good prognosis
  - **If Prolonged** ⇓ Bad prognosis "Fulmination"

Etiology

⇓

Viral markers

For follow up:
1) Recovery → SGOT. (Short ½ life)
2) Relapse → SGPT. (Sp./Sn.)
3) Chronicity → Viral Markers

Treatment of Acute Viral Hepatitis

Conservative

- **Rest** — Till clinical & Bioch. normal.
  - **HA** rest for 1 m.
  - **HB** rest for 2 ms.
- **Diet** "كل اللي انت عايزه"
  - ↑ CHO + IV Glucose (if s. anorexia / vomiting)
  - ↓ Fat (due to nausea-dyspepsia e Cholestasis)
  - **No Protein restriction** except e fulmination.

Drugs

- **Steroids**
  - May lead to exacerbation?! dt viral infection
  - Used with prolonged cholestasis?!!
- **Interferon for HCV**

Immuno-prophylaxis for HAV - HBV

Chronic Hepatitis

"Inflam. of the liver parenchyma > 6ms w out resolution in
Occurs in HBV / HCV not HAV"

Chronic Persistent Hepatitis "mild"

➢ **Cl./P**

1) **Asymptomatic … follows HBV.**
   "discovered accidently during routine invest."
2) **Non-specific Symptoms:**
   - **Fatigue.**
   - **Pain** in Rt. Hypo-chondrium.
   - **Fat** intolerance.

➢ **Invest.**

1) **L. Enzymes** ⇒ ↑SGPT /SGOT **"mild & persistent".**
2) **Sonar** ⇒ -ve / mild liver++
3) **Markers** ⇒ ± ve **HB sAg.**
4) **Biopsy** ⇒ **PT infiltration** + **No loss of arch.**
   "Un-explained & persistent ↑ enzymes is an indication of liver biopsy"

➢ **NB: Super-infection e HDV …**
flare up of Mild Ch. HBV to severe form.

➢ **DD** ⇒ **Gilbert's $ & Post hepatitis $.**

Chronic Active Hepatitis "sever"

Viral

Asymptomatic up to LCF & PH

Hepatitis > 6ms
- **Jaundice.** *"mild or absent"*
- **F A H M.**
- **tender liver ++.**

Cirrhosis → LCF, PH

Extra-Hepatic

Viral
- **HBV**
  - Arthritis
  - GN Membranous
- **HCV**
  - Arthritis.
  - MPGN due to cryo-gb

Auto-immune ♀
- PH? AG:
  - Poly Arhtritis.
  - Hashimoto's.
  - AIHA.
  - Grave's D.

1) **L. Enzymes** ⇒ mild ↑ (3-5 folds)
2) **S. Albumin** ⇒ normal or (↓ in late stage)
3) **Markers** ⇒ Viral or ……. → **Auto-Immune Markers**
   - **Type I "Lupoid"** — **+ve ANA**, **+ve ASMA**
   - **Type II**
     - **II A** — +ve LKM
     - **II B** — +ve SLA
4) **Biopsy ⇒ most imp. "starts in PT".**
   - **Mild** — Piece meal necrosis.
   - **Moderate** — Bridging necrosis.
   - **Severe** — Rosette app. → Cirrhosis.

➢ **how to diff. bet Types of sevre form?! …. HB sAg / HCV**
- **HB sAg** → **with Hx & E stain** …Ground glass app.; **Specific stained by Orcein.**
- **HCV** ⇓ **Lymphoid f.**

✓ **Biopsy:** ***Lymphoid follicles.***
plasma cell infiltration.

Chronic Persistent Hepatitis

Treatment:

1) Re-assure.
2) Follow up/ 6ms "SGPT"
3) Avoid hepato-toxic drugs.
4) hepatic support. "Hepamax®"

Prognosis

- Super-infection e HDV ⇒ flare up of mild Ch.HBV to sever form.
- DD ⇒ Gilbert's $ & Post hepatitis $.

Monitor Interferon After 3 ms

- If +ve PCR ⇓ Not responding ⇓ Stop Interferon
- If -ve PCR ⇓ Good response ⇓ Cont. Interferon

Chronic Active Hepatitis

-Viral

Interferon: "Conventional"

	HBV	HCV
• Dose	• 10 mill. U 3 times / wk ↑dose • 1/2n yr. ↓ duration.	• 3 mill. U 3 times / wk ↓ dose • 1 yr. ↑duration.
• Indication	1) +ve HB eAg 2) +ve DNA polym. 3) +ve PCR (Active Viral Replication) 4) ↑↑enzymes. 5) Biopsy. "bridging N."	Given e Ribavirin ✓ ✓ ✓
• S/E	1) Flu like + Arthralgia ⇒ Paracetamol. 2) BM (-) ⇒ # Thrmbo-cytopenia. most imp. bec. in CLD the pt. has: A) hyper-splenism dt PH. B) Bl. tendency. (1972) 3) Teratogenic ⇒ # pregnancy. 4) Hemolytic anemia. 5) Depression.	
	"Pegylated" Interferon (1 ampoule 180 ?gm SC once/wk.)	
	For 4 ms.	For 1 yr. + Add Ribavirin
	Other Drugs	
	Lamivudin. (Oral) for 1-2 ys. alone or e Interferon	

Auto-Immune

Steroids

Full dose	Gradual w to ½ dose	Low MD
30 mg /d	10-15 mg/d	10-15 mg/d for 6 ms.

Clinical & Lab tests / month & Liver Biopsy at 6th m

- Full remission ⇓ Contineu Steroids & Restart if Relapse occurs.
- No remission ⇓ Contineu Steroids + Azathioprine "steroid sparing"

For 2-3ys or for Life ... so When to Stop?!!

- -ve ANA Marker.
- Normal:
  - Transm. – Bilirubin.
  - γ Globulin – Biopsy.

Portal Hypertension

➢ Causes

Pre-sinusoidal: (MCQ)

- B – Sarcoidosis.
- 1ry Biliary Cirrhosis. "gr. in PT"
- PV thrombosis.

Sinusoidal:

- Liver Cirrhosis.(M/C)
- Alcoholic LD*.

Post-sinusoidal:

- HV occlusion. "Budd Chiari $"
- CV occlusion. "Veno-occ. & * "

➢ Humoral factors:

- ↑ Endothelin ⇒ VC.
- ↑ NO & Glucagon ⇒ VD → ⊕ RAS → salt retention → Maint. PH

➢ Cl./P of ...

of the Cause

⇓

Chronic Liver D.

"Cirrhosis"

PH

⇓

1) Asymptomatic.
2) splenomegaly
   if dt Cirrhosis ± collaterals on Abd. Wall.

Complications of PH

- hematemesis due to:
  - ✓ rupture EV. "painless – profuse"
  - ✓ rupture PU. "painful – scanty"
- RF dt Toxins + IgE → shock → pre-RF = ATN.
- hyper-splenism. "pan-cytopenia"
- h. Enceph. (P-S) "if high protein diet"

➢ Invest.

- LFTs.
- Stool / Urine for B ova.
- Biopsy. "diagnostic"

- Sonar: ↑ PV D
- Duplex scan.

- Endoscopy. (Grading)
- Ba swallow.

➢ Patho-physiology

1) Splenic Ⓥ
   ⇒ Splenomegaly
   → Hyper-splenism.
   → Pan-cytopenia.
2) Gastric Ⓥ
   ⇒ Gastropathy
   → Dyspepsia
   → GIT bleeding
3) Intestinal Ⓥ
   ⇒ Dyspepsia.
4) P – S Shunts
   ⇒ H. Enceph.
   ⇒ Caput medosa EV
   تلك هي المشكلة
5) Ascites
   ⇒ Localizing factor

➢ Treatment of rupture E-V

Medical

Shock

↓

- BLOOD
- FLUID
- PLASMA
- VIT. K

h. Enceph.

↓

E N L

↓ Portal BP

(VC of mesenteric BVs. → ↓ Bl. flow to intestine → ↓ PH)

During the Attack

1) Vaso-pressin Non-(S) → MI so add nitrates
2) Terli-pressin (S) → no systemic SE
3) Octereo-tide Stomato-statin analogue.

In-between (Indral)

- MOST EFFECTIVE
- ↓HR to 75%.
- ↓COP

"S/E → no comp. ↑HR if the pt. bleeds"

Instrumental

Inj. Sclero-th.

(BEST DURING EMERGENCY)

⇓

OBLITERATES THE LUMEN.

Bucrylate (histocryl®)

Banding

(Sang-staken tube)

⇓

Mech. comp. of ruptured EV

(Transient till sclero-th. is done)

Surgical

P-S shunts

1) Porto – caval.
2) Mesen-caval.
3) Lineo-Renal.
4) TIPSS. (TTT. of EV / HE in decomp. liver / Ascites)

Splenectomy

De-vascularizatn

⇓

"Hassab op."

"Ascites"

"excess accumulation of fluid in peritoneal cavity"

➢ PATHOGENESIS

- **↓protein synthesis**
  ⇓
  ↓s. Albumin
  ⇓
  ↓ONCOTIC PR.
  ⇓
  ESCAPE OF FLUID TO ISF
  ⇓
  Hypo-volemia
- **Others**
  - **Hormones**
    ⇓
    "↑production dt* & ↓breakdown"
    1) Aldosterone
    2) ADH.
    3) ANP.
  - **P H**
    ⇓
    ↑capillary pr. in splanchnic area.
    ⇓
    localizing f. ⇒doesn't cause Ascitis Alone

VD DT (NO & PG)+ HYPO-VOLEMIA

⇒↓IV VOLUME ⇒⊕RAS ⇒⊕ALDOSTERONE & ADH.

➢ CAUSES OF ASCITES

- **CIRRHOSIS**
- **NON-HEPATIC**
  - **e LL edema**
    - **Generalized**
      - **Heart**
        ⇓
        CHF
        ⇓
        +VE HISTORY
      - **Kidney**
        ⇓
        NEPHROTIC $
        ⇓
        (PUFFINESS + PROTEINURIA)
    - **Others**
      - **Acute Pancreatitis ⇒Hgic.**
      - **Ovary** →Meig's $ (Ovarian tumor + Ascites + Rt. Effusion)
      - **Meyxedema.**
      - **Budd Chiari $.**
  - **No LL edema**
    - **Local Causes**
      (Laparotomy for Biopsy)
      - **TB peritoniti.** "Uri-lat. Shifting dullness & loculated Ascitic fluid"
      - Mesothelioma. "Wt loss"
      - Metastasis from Cancer Ovary.
    - **Ascites precox**
      - Cirrhosis c Diuretics. "DT LOCALIZATION BY PH"
      - Const. pericarditis.

➢ Cl./P of Ascites

1) **Inspection:**
   a) G. ABD. DISTENSION MAINLY IN FLANKS.
   b) SUB-COSTAL ANGLE ⇒WIDE.
   c) DIVERCATION OF RECTI & DILATED VEINS. (DT PH OR IVC OBST.)
   d) UMBILICUS ⇒EVERTED – SHIFTED DOWNWARDS.
2) **palpation:**
   a) FLUID THRILL
   b) DIPPING METHOD ⇒LIVER & SPLEEN ARE FELT.
   c) ABD. SWELLINGS ⇒IN TB PERITONITIS OR MALIGNANT ASCITES.
3) **percussion:** SHIFTING DULLNESS — KNEE ELBOW METHOD.
4) **Auscultation:** PUDDLE SIGN — VENOUS HUM OF PH.

➢ NB: 2ry effects of Ascites

1) Rt Pleural effusion dt natural channels bet peri. & pleura
2) Apex ⇒ shifted upwards.
3) Edema follows Ascites. (Ascites precox)
4) Congested neck veins.

NB ⇒ Ascites + PL effusion.

- **Rt. PL. effusion**
  ⇓
  More common dt Natural channels bet. Peritoneum & Rt. pleura
- **Lt. PL effusion**
  ⇓
  Lung pathology (Pneumonia / TB)
- **Bilateral Effusion**
  ⇓
  sever hypo Albuminemia.

Investigations for Ascites

1) **Of the cause**
2) **Laparoscopy:** *for Malignancy or TB.*
3) **Tap ping:** بذل
   a) ***TB*** ⇒ *C &S then ZN.*
   b) ***Pancreatitis*** ⇒ *WBC & Amylase.*
   c) ***Malignancy*** ⇒ *Cytology.*
   d) ***Albumin.***

	Transudate	Exudate
Cause	Part of G. edema	Inflam. / Malig.
Protein	< 3 gm/dl	> 3 gm/dl
Cells	↓↓	↑↑
LDH	↓	↑
Sp. G.	< 1018	> 1018

➢ Albumin Gradient

(SAAG = p. Albumin – Ascitic Albumin)

- ≥ 1.1 ⇓ **Transudate** ⇓
  - **Un-Complicated Ascites**
    - PH.
    - 3 major causes of G. edema.
- < 1.1 ⇓ **Exudates** ⇓
  - **Complicated Ascites**
    - Malignancy
    - TB peritonitis.
    - SBP.

➢ Treatment of Cirrhotic Ascites بالترتيب

1) **Rest in bed** ⇒ ↑ *RBF* → *diuresis.*
2) **Diet:** ⇒ ↓ **NaCl** *to 2 gm/D* + ↓ **Water** *to 1L/day esp. in hypo-natremia)*
3) **Diuretics:** بحذر شديد!!

Aim is Wt. loss		Spironolactone		Lasix
× LL edema ⇓ ↓½ kg/Day	1) Start with	100 mg/D	If No response → Add	40 mg/D
	2) ↑ Dose Gradually every 4-5 days upto (X 4)	400 mg /D		160 mg/D
✓ LL edema ⇓ ↓1 kg/Day	• S/E:	Gynaecomastia.		↓ Na / K & BV.

If Resistant to RDD:

4) **IV Albumin infusion.**
5) **Tapping:**
   (2-3 L/session + IV Albumin 10 gm / L)
   To avoid re-accum. & EI)

- **Criteria for safe Para-centesis:**
  1) Tense asictes.
  2) LL edema
  3) PT > 40%
  4) Platelets > 40,000/mm3.
  5) Bilirubin < 10 gm%.
  6) Creatinine < 3 mg% Hepato-Renal $.

6) **Last lines of treatment:**
   a) **Le veen shunt** *connects JV & Peritoneum SC* ⇒ *obstruction - infection V. overload. - EI.*
   b) **Ultra-filtration & Re-infusion.**
   c) **TIPSS** ⇒ *encephalopathy in 30%.*
   d) **Liver transplantation.**

Refractory Ascites

Def.: Diuretic resistant RDD.

TTT.: ما بعد ال Diuretics .

Causes:

1) *Check: Salt & Albumin level.*
2) *Low salt $: (stop diuretics+ fluid restriction for 2 days → then resume diuretics)*
3) *Malignancy & TB peritonitis.*
4) *Bad Kidney functions.*
5) *Weak or Low dose diuretic.*

Interactable Ascites

Can't be ttt. by Diuretics dt Diuretic induced encephalopathy.

⇓

Liver transplant

Hepato-Cellular Carcinoma

➢ **Def.:** common malignant tumor
- affecting [illegible]
- above age of 40 yrs.

➢ **Cl./P ⇒** **"Cirrhotic pt. c̄ rapid un-explained deterioration" ⇒ HCC ?!!!**

1) **LCF + Abd. Pain + Jaundice + F A H M.**
2) **Resistant Ascitis.**
3) **Para-malignant S:**
   - ↑ Insulin → hypo-glycemia. *(also dt ↑ consumption of G. by Malig. cells)*
   - ↑ PTH → hyper-calcemia.
   - ↑ TSH → hyper-thyroidism.
   - ↑ EP → Poly-cythemia.

➢ **Causes (3A + HC)**

1) **HBV – HCV:** DNA of HBV integrates with the hepatocyte genome.
2) **Cirrhosis** (Hemo-chromatosis / Alcoholic not Wilson's)
3) **Alcohol** is a co-carcinogen c̄ HBV.
4) **Afla-toxin** of A. Flavus found in ground nuts.
5) **Androgens** (TTT. of Endometriosis)

➢ **Investigations of HCC**

- **Tumor markers**
  - **α-Feto-protein** ⇓ *Sensitive, not specific*
  - **Des-Carboxc** ⇓ *Specific, not sensitive*
- **Imaging**
  - **Focal lesions only** ⇓ *Sonar; Radio (TCAA) (local area c̄ low uptake)*
  - **Benign / malig.** ⇓ *MRI / Spiral CT*
- **Biopsy**
  Better to be avoided if HCC is suspected & sure.

➢ **Treatment of HCC**

- **Medical** (un-satisfactory)
  - Local in CT
  - Systemic
- **Embolization** "Gel foam" ⇓ Ischemic necrosis.
- **Surgical**
  - **Resection if**
    - Localized tumor
    - Non-cirrhotic pt. "less to prone post op. hepatic insufficiency"
  - **Transplant "of choice"**
    - Patent HA & PV
    - Good ...
- **Recent "non-surgical"** "for small / localized tumors"
  - **Ethanol inj.** *Co-ag. necrosis of tumor cells; Thrombosis of tumor BVs.*
  - **Radio-frequency**

	H. Hemo-chromatosis	Wilson's Disease	Alcoholic Cirrhosis	1ry Biliary Cirrhosis
➢ Def. & Etiology	**Mutation in HFE Gene on Chromosome 6 + ↓ Hepcidin G.** ⇒ secret protein that ⇒ ↑↑ Iron absorption from SI ⇒ ↑ Total body Fe >> IBC ⇒ ↑ free Iron in blood ⇒ Fe deposition in liver ⇒ Cirrhosis	**Cu in diet absorbed in Stomach & SI** ↓ cerulo-plasmin synthesis by liver. ⇓ ↑ free Cu in Bl. ⇓ deposition in t. un-able to excrete excess Cu from liver to bile ⇓ accumulation of Cu in liver ⇓ Cirrhosis	**Alcohol** ↑ Acetaldehyde ⇓ Hepato-toxic ↑ h^+ disrupts CHO/Fat metabolism ⇓ ↑ FA synthesis ⊕ Micro-somal metabolism ⇒ ↑ Toxicity of drugs	**Unknown Auto-immune** ↓ T-supp. ↑ T-cytotoxic ⇓ Inflam. mediators. ⇒ Granuloma in PT → peri-portal fibrosis ⇒ Intra-Hepatic Biliary obst. ⇒ bile irritate hepatocyte ⇒ ch. inflam ⇒ Cirrhosis.
➢ Incidence	AR ⇒ Males - 40 ys. most helps loss of Iron (slowly progressive)	AR ⇒ Young Adults. "Recurrent Acute hepatitis"	heavy Alcoholic. > 30 gm > 20 gm/day Over 5-10 ys	Middle aged (40-50) (Itching then Jaundice)
➢ Cl./P				
1) Causes:	**(H P)² S J** Triad of (1-3-5) 1) H epatomegaly. (paradox) 2) H eart ⇒ Cardio-myopathy. 3) P ancreas ⇒ Bronze DM. (never in hemo-sidrosis) 4) P ituitary ⇒ ↓ gonadal f. 5) S kin ⇒ Bronze (Dark-Gray) in axilla - groin - genitalia - exposed areas. 6) J oint ⇒ chondro-calcinosis. = pseudo-gout	**Honda (CBR)²** 1) H epatitis ⇒ (Recurrent Attacks) 2) C ornea ⇒ Keyser Fleisher ring. 3) C hondro-calcinosis = pseudo-gout 4) B G ⇒ Involuntary mov. 5) B lue Nails' lanulae. 6) RT damage ⇒ Glucosuria. 7) H emolysis.	**3 stages** Intake for ms. ↓ Fatty liver ↓ Reversible if Alcohol is stopped & Asymptomatic Liver ++ ⇓ dt fatty infiltr. of the liver c no inflam. process Tender ⇓ dt stretch of capsule. Intake for ys. ↓ hepatitis ↓ + Special D. Criteria	↑ components in bl. / ↓ function ↑ BS ⇓ Itching 1st for 2ys "& responds only to Naloxone" ↑ D. Bilirubin ⇓ Jaundice ↑ Cholesterol ⇓ Xanthelasma, Xanthoma on (palmar creases & buttocks) fat intol. ↓ fat sol. Vit. Dyspepsia 1) ↓ Vit. K ⇒ bl. tendency 2) ↓ Vit. D ⇒ "hepatic Osteo-dystrophy"
2) Cirrhosis LCF + PH	Slowly progressive ⇒ patient is usually adult		Alcoholic Cirrhosis / Alcohol is a VD: • LCF > PH • Palmar E. • hyper-dynamic circ. • Poly Neuropathy. • Spider Navei. (in SVC dist.)	Other Auto-Immune: AIHA / Arthropathy / Scleroderma / Thyroid / Sicca $.

	H. Hemo-chromatosis	Wilson's Disease	Alcoholic Cirrhosis	1ry Biliary Cirrhosis
Invest. ➢ **Cause**	1) **Iron profile:** • ↑ s. Iron & s. Ferritin. (Not Accurate bec. is an Acute phase reactant) • ↓ IBC. • ↑ Trans-ferrin sat.. "Also for screening of FM" 2) ↑ Blood & Urine Glucose dt DM.	1) **Blood:** • ↓ Cu dt deposition in Tissues. • ↓ Ceruloplasmin or Normal? • ± hemolytic anemia dt ↑ Cu. 2) **Urine** ⇒ ↑ Cu → RT Damage → ↑ Glucose, P, AA	**Hepatitis Specific Criteria "GAM,EL"** 1) γGT (Normal ALP) "شيء حميل" 2) AST > ALT (2:1 as Alcohol (-) ALT dt ↓ B6.) 3) IgA 4) Macro-cytosis non-Megalo-blastic. 5) Biopsy ⇒ Mallory hyaline hepatocyte. (Not-pathognomonic)	**Biliary Obstruction (BSSA)** 1) Bilirubin.(Direct) 2) ALP / γGT. 3) s. Transaminase. "mild" 4) s. Cholesterol. 5) Auto-Abs: 1) ↑ IgM. 2) AMA (Anti-mitoch. Ab to diff. from 1ry Sclerosing Cholangitis)
➢ **Cirrhosis** (Sonar / Biopsy)	1) Sonar. 2) Biopsy ⇒ Fe (Prussian-blue)	1) Sonar. 2) Biopsy ⇒ Cu (E special stain)	1) Sonar.(bright Fatty liver) 2) Biopsy... (c above)	1) Sonar. 2) Biopsy ⇒ PT Granuloma.
➢ **Treatment**				
1. Causes	1) **Venisection:** • To mobilize iron stores. • Weekly / 2 ys. • 3-4 times / yr then... 2) **Fe Chelator** ⇒ Desfroxamine to pt. if he can't tolerate (1)	• **Cu Chelator:** 1) Penicellamine.(v. toxic) 2) Zn acetate. "long life"	**General** 1) Stop Alcohol 2) G. nutrition. 3) Vit. B_1 (Thiamine).	**Immune-supp. Drugs** 1) Azathioprine. 2) No steroids used → bec. it can agg. osteo-dystrophy + Osteo-porosis.
2. Sympto-matic	• DM ⇒ Insulin. • Hypo-gonadism ⇒ Androgens. • Cardio-therapy.	• Ttt of Extra ....manifest. (Haemo-chromatosis = defect in SI Wilson's = defect in Liver itself)	**Alcoholic Hepatitis** • Steroids in sever inflam. • IV AA. (Essential - Branched) • IV Vit. (B_1 - B_6 – C) • NAC & Pentoxifuline → Trental®	• Cholastasis ⇒ Urso-Deoxy-cholate. • BS Chelator ⇒ Cholestyramine E break/asmo (-) Entero-hepatic circ. • Itching ⇒ Anti-histamines ± Naloxone. • Vit. (ADEK + Ca)
3. Cirrhosis TTT.	Supportive TTT. → Hepa-max plus Urso-falc	Follow Up by.. → Child Classif. (LCF / PH); Sonar & α - FP for HCC		Liver Transplant → Not in hemo-chromatosis "bec. the defect is in SI not Liver"

LIVER CELL FAILURE

"MANIFESTATIONS OF DECOMPENSATED LIVER DISEASE"

➢ CHEST ⇒ HEPATO-PULMONARY S

- VD causes opening of
  - Intra-pulmonary A-V shunts. ↓ Hypoxia & Central Cyanosis "doesn't respond to O_2 th."
  - Porto-Pulm. shunts.
- Ascitis & PL effusion
  - ↓PFT (DIFFUSION DEFECT)
  - PLATYPNEA ORTHODEOXIA
  - BASAL ATELACTASIS

➢ CVS:

ESTROGEN, NO – PG – VIP } VD ⇒ hyper-dynamic circ. ⇒ if severe ⇒ Shock.

Endocrine: hypothalimic - pituitary dysf. + ↓ break down of h.

	MALES	FEMALE
GENITALIA	• FEMALE DIST. OF HAIR. • IMPOTENCE & ↓ LIBIDO.	• AMENORRHEA & • INFERTILITY.
BREASTS	• GYNAECOMASTIA	• ATROPHY.

➢ Blood

- ANEMIA
  - MICRO ⇓ Iron def, dr (EV + PU)
  - NORMO ⇓ dr hyper- splensim + toxic BM (-)
  - MACRO ⇓ Macro- cytosis NON-MEGALOBLASTIC DT hyper-uridemia
- BL. TENDENCY
  - ↓ platelets: dr hyper- splensim.
  - ↓Co-agulation: ↓ PT – Fibrinogen, ↓ Vit. K (1972)

➢ GENERAL

1) GC ⇒ bad.
2) Fever "low grade"
   - RES DEFECT → BACTEREMIA.
   - ↑ IL_1 – TNF.
3) Foetar Hepaticus dt: MERCAPTANS absorbed from SI
   → bypass hepatic detox
   → excreted in mouth & breath.
4) Jaundice. (sign of decomp. In chronic liver D. In acute liver disease it Cholestatic jaundice).

➢ Ascitis & Edema dt

- ↓ protein synthesis ⇓ ↓ s. ALBUMIN ⇓ ESCAPE OF FLUID TO ISF ⇓ hypo-volemia*
- Others
  - Hormones ⇓ "↑production dt* & ↓breakdown"
    1) ALDOSTERONE
    2) ADH.
    3) ANP.
  - P H ⇓ ↑capillary pr. in splanchnic area. ⇓ localizing f. ⇒ doesn't cause Ascitis Alone

LYMPHORRHEA: "post-sinusoidal obst. → engorgement of lymphatics → extra-vasation into peritoneum."

➢ Skin

- Spider naevie.
- Palmar Erythrema.
- White nail. (Terry's Nail)
- Paper money skin.

Hepatic Encephalopathy

➢ **Def.:** Neuro-psychiatric complex dt ↑ brain (NH_3 / Toxins) occurring at the peak of LCF DT:

a) Failure of liver detoxification &

b) By pass porto-systemic shunts.

➢ **Types**

1) Fulminate HE. (Acute liver disease)
2) Cirrhotic HE. (following ppt. factors)
3) Chronic P-S HE. (dt spont. shunting in pts. c PH)

➢ Pathogenesis: ↑protein load leads to

- ↑ NH_3
  - (-) Kreb's Cycle ⇓ Hypo-glycemic Like coma
  - ↑ GABA in brain ⇓ CNS (-)
  - Disturb. in AA Synthesis (↑Aromatic & ↓Branched AA)
    - ↓ NE synthesis
    - ↑ Octopamine "false NT" ⇓ Competitive (-) of Dopamine R.
- ↑Mercaptans → CNS (-)

➢ Precipitating Factors

- ↑ NH_3 dt
  - ↑protein load dt
    - Diet (protein Restriction)
    - GIT bleeding (EV – PU)
      - Shock ⇓ ↓h. perfusion
      - ↑protein load ⇓ ↑metabolites
  - E I due to "hypo-kalemia & Alkalosis"
    1) Diuretics. (excessive use)
    2) Tapping of Ascitis. (Avoided by albumin inf.)
    3) Severe (V – D)
- ↑ Toxins dt
  - Infection by
    - B. flora ↓ 3rd G CS
    - SBP ↓ Flagyl / Neomycin
  - Constipation (Lactulose & Enema)

DD of HE Delirium

1) هيجان شديد.
2) سلوك غريب.
3) تدهور الوعي.

1) D. tremens. (Diazepam)
2) Hypo-glycemia. (Glucose)
3) H. Encephalopathy.
4) Psychiatric disorder.
5) Drunkenness.
6) Hypoxia.
7) Sub-dural Hematoma → Old age / Trivial trauma

Hepatic Encephalopathy

➢ Cl./P of H. Encephalopathy

Clinical Diagnosis mainly.

Lab Invest.

To confirm liver D. not Encephalopathy

⇓

(↑ PT - ↑ Bilirubin - ↓ Albumin)

➢ Stages

Pre-coma

1) Deteriorating GC.
2) Abnormal behavior – Childishness.
3) Excited.
4) Dysarthria / Chorea / Yawning / hicough.
5) Flapping tremors. "Astrexia"
6) Hyper-reflexia – hyper-tonia.

Coma

⇓

responds to painful ⊕ only.

Early Diagnosis by

➢ **Primitive tests**

- Constructional Apraxia.
- Number Connection test.

➢ **Labs invest.**

1) EEG ⇒ DELTA W. (SLOW & ↑AMPLITUDE)
2) VEP
3) Blood NH_3.

➢ Grading of H. Encephalopathy

0	Sub-clinical ↓ INTELLECTUAL FUNCTIONS.
I	Apathy + Reversal of Sleep rhythm + Flapping t. + Confusion + Agitation.
II	Lethargy ⇒ RESPOND TO VERBAL ⊕ + FLAPPING T.
III	Stupor ⇒ RESPOND TO VIGOROUS ⊕ + HYPER-REFLEXIA.
IV	Coma: a) Early ⇒ … to pain b) Late ⇒ X to pain.

Treatment of H. Encephalopathy

1) Avoid ppt. factors.	Stop diuretics.
2) Protein restriction	(قطعة لحمة صغيرة) = 0.6gm / kg / d
3) B. flora	Flagyl & Neomycin. *Nephro- & oto-toxicity, "obsolete"*
4) Infection (SBP)	3rd CS or Cepro-floxacin.
5) Enema / 8hrs. acc. to need.	
6) Lactulose (10-30 ml / 8 hrs.) ⇓ *"Dose is adjusted to produce 2 semi-soft stools / Day."* *"If not ⇒ sever diarrhea ⇒ EI ⇒ H. encephalopathy"*	"Non-absorbable disaccharide" → Osmotic purgative ⇓ *Wash bowels from nitrogenous subst.* ; Fermented to Organic A. ⇓ Release H^+ (↓ pH) → $NH_3 + H^+ \Rightarrow NH_4$; (-) B. flora

➢ **NB:** If sedation is necessary (violent pt.)

a) Short acting BZD → Midazolam.

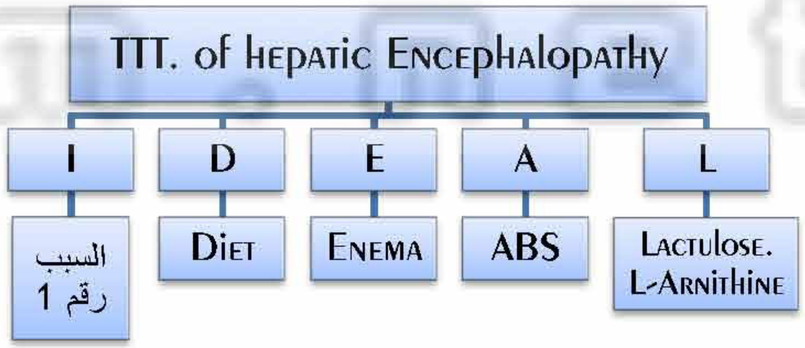
b) Anti-dote → Flumazinel.

L-arthinine, L-Aspartae

(Hepamerz®) ⇒ ↓ *blood NH_3*

➢ Recent trends in ttt. of H. Encephalopathy:

1) Haemo-perfusion.
2) Flumazinel dt hyper-snstive BZD –R.
3) Bio-artificial liver support.
4) Liver transplant.



Liver Function Tests

- **Synthetic functions** "compensated / decompensated"
  - **s. Albumin** "long 1/2 life = 14 -21 days"
    - Acute LD
      - Normal Albumin "so its is bad indicator" but may ↓ in sever form.
    - Chronic LD "Cirrhosis"
      - ↓ s. Albumin " if Decompensated"
        - **In Liver Cirrhosis; Total serum proteins may be Normal due to:** ↓ Albumin + ↑ γ Globulins
  - ↑ PT "short 1/2 life" & more sensitive
    - Vit. K inj.
      - No response
        - Parenchymal LD .. so if
          - ↑ PT in AVH
            - Fulminant Hepatitis
          - ↑ PT in Chronic LD
            - Decompensated liver
      - Improved
        - Biliary Cirrhosis "Cholestasis"
- **s. Bilirubin**
  - ↑ Indirect (>80% Un-conj.)
    - ↑ Production
      - ↑ Hemolysis
        - ↓ Hb.
        - ↑ I. bilirubin.
        - ↑ Retics.
    - ↓ Uptake
      - Gilbert $ "discovered acc. during follow up of viral hepatitis"
        - Jaundice only
          - ↑ I. bilrubin only.
          - N. Hb.
          - N. liver enzymes.
  - ↑ Direct due to (Conjugated)
    - Obstruction
      - Cholestasis
        - Intra-hepatic
          - 1) PBC.
          - 2) Hepatitis.
          - 3) Drugs: OCP - Androgens.
          - 4) Pregnancy.
        - Extra-hepatic
          - 1) Gall Stones.
          - 2) pancreatic T.
          - 3) PSC.
    - Hepato-cellular D.
      - LCF
    - ↓ secretion to bile
      - Dubin-Jhonson (AR + pigment)
        - Diagnosis of Exclusion:
          - No Obst.
          - No LCF.
        - 1) +ve BSP clearance test
          2) Dark pigment in hepatocyte.
        - Rotor $ (AD) as Dubin J. but No pigment

	Cholestasis	LCF
1) PT after Vit. K inj.	N	↓
2) s. Albumin.	N	↓
3) Enzymes	ALP > Trans. γ GT (4-6X)	Trans. > ALP (2X)

Liver Biochemistry

Hepato-cellular damage?!

Trans-Aminases

SGOT "AST"

1) Cytoplasm + Mitoch.
2) Non-specific (↑ e MI)
3) short 1/2 life.

↑ in Early onset of Recovery used for Follow Up.

1) mild ↑ or N → Ch. hepatitis. "mild form" or liver Cirrhosis.
2) ↑↑ 3-5 times → Ch. hepatitis. "sever form"
3) ↑↑ upto 1000 → Acute hepatitis.

NB: in All Liver Diseases:
- ALT > AST except in Alcoholic (AST > ALT)
- as Alcohol → ↓B_6 → ↓ ALT synthesis.

SGPT "ALT"

1) Cytoplasm only.
2) Sp. / Sn.
3) long 1/2 life.
(-) by Alcohol intake.

Cholestasis ?!

↑ ALP + ...

↑ γ GT "more senstive"

Hepatic origin
"except in Alcohol intake" (Normal ALP + ↑ γ GT) dt absence of H-C damage.

so ALP ...

mild ↑

Intra-hepatic Obst.

parenchymal LD
- hepatitis.
- hepatic metastasis.
- Amoebic liver.
- hepatic infiltration in leukemia & lymphoma)

↑ Trans. > ALP (ALP = 2X)

marked ↑

Extra-hepatic Biliary Obst.

"Cholestasis"
- PBC.
- CBD Obst.
- Cancer head.

↑ ALP > Trans (ALP = 4-6X)

Normal γ GT

Non-hepatic
"Other sources of ALP"

1) Bone:
- Paget's D. (ALP = 10X)
- hyper-PTH .
- Rickets / Gr. child.
- healing fracture. (Transient ↑)
- Osteogenic Bone Cancer
- CRF → ROD.

2) Intestine.
3) placenta.(pregnancy)

Total plasma pr.

(Albumin + ↑ γ Globulins)

Mono-clonal

Multiple Myeloma

- Old male.
- bony aches.
- ESR >> 100.
- ↑ Total PP.

poly-clonal

1) Liver D. (Cirrhosis)
2) Chronic Infection.
3) Collagen D. "SLE"

Immuno-Electroph.

1) IgG → Chronic Active hepatitis.
2) IgA → Alcohol hepatitis.
→ Cirrhosis.
3) IgM → 1ry Biliary Cirrohsis.

Cholesterol level:

1) Obst. Jaundice	↑
2) PBC	↑
3) LCF	↓

Other Markers:
1) Viral markers
2) Auto-immune markers
3) Tumor markers

α Feto protein	Des-γ Carboxy PT
Sn. But Not specific.	Specific
Done every 3-6 ms. In Cirrhotic pt. for follow up.	Not sensitive.

Lab values for Liver Investigations	
1) PT	10 – 14 sec.
2) ALT / AST	0 – 35 U/L
3) ALP	50 – 175 U /L
4) Cholesterol	150 – 240 mg/dL (Recommended < 200 mg/dL)
5) Total plasma pr.	2 – 3 mg / dL
6) s. Bilirubin	
• Total	0.3 – 1 mg /dL
• Direct	0.1 – 0.3 mg/dL
• Indirect	0.2 – 0.7 mg/dL
7) αFP	< 25 ng/ml. Sensitive but non-specific.

Hepatotoxic Drugs

• Acute hepatitis	✓ Halothane. ✓ INH, Rifampicin.
• Chronic hepatitis	✓ Methyldopa. - INH. ✓ Nitrofurantoin - Fenofibrate.
• Cholestasis	✓ Anabolic steroids. Phenothiazines. ✓ OCP. TCA ✓ Oral hypoglycemic.
• Fatty liver	✓ Tetra-cyclin. Amiodarone. ✓ Na valproate -> (anti epileptic). ✓ Steroids.
• Hepatic necrosis	✓ Paracetamol (toxic dose > 15 gm). ✓ Carbon tetrachloride. ✓ Amanita mushrooms.
• Pelioses hepatis	✓ Anabolic steroids. ✓ OCP.
• Hypersensitivity	✓ Allopurinol. Antithyroid drugs. ✓ Sulfonamides. Penicillins.. ✓ Phenytoin.
• Budd chiari $	✓ OCP
• Adenoma	✓ OCP - Anabolic steroids
• Hepatoma	✓ Danazole

OCP:
- Cholestasis
- Pelioses hepatis
- Budd chiari $
- Adenoma.

Drugs Causing Jaundice= hepatotoxic + Drugs causing haemolysis.

Direct Toxicity	Idio-syncracy
• Predictable. • Dose dependent.	• Unpredictable. • Dose independent → immune reaction + drug metabolism
- Acetaminophen. - Amanita mushroom. - Carbon tetrachloride.	- Halothane. - Phenytoin. - Isoniazide. - Na valproate.

Amoebic Liver Abscess

Etiology

Amoeba in colon
→ portal vein
→ liver
→ Abscess in the Rt. lobe due to the streaming effect

Abscess contents = Anchovy sauce

Necrotic Tissue +
RBCs & WBCs +
Amoebae in the abscess's wall

Clinical picture Insidious Onset of

History of Ambiasis

Dysentery.
Constipation & diarrhea

Hepatitis like but there are

1) Severe Toxemia + pain in rt. hypochond.
2) Intercostal tenderness.
3) Tender fist percussion.
4) No Jaundice ....only if severe infection.

Jaundice + Leucocytosis:

1) Amoebic liver Abscess. "Neutrophilia"
2) Leptospirosis. (الفار)
3) Asc. Cholangitis
   (Gall Stone → CBD Obst. → Stasis → Infection)
4) Fulmininat liver failure → Necrosis of liver

Investigations

1) ↑ ALP.
2) Sonar → Cyst → Aspiration → Anchovy sauce.
3) Leucocytosis → "Neutrophilia Not lymphocytosis"
4) Rt pleural effusion by X ray.

Treatment of Amoebic Liver Abscess

Flagyl + ABS
(Infusion 500mg/8hrs)

Aspiration if

Large abscesses.
Left lobe abscesses.

Fulminant Hepatic Failure

"Acute Liver failure → hepatic encephalopathy + no ppt. factors in < 8 wks."

Causes

1) Viral → HBV + D – C – E (with pregnancy)
2) Drugs → Paracetamol Toxicity (>15gms=30tab), INH.
3) Alcohol toxicity + Amanita poisoning.
4) Acute fatty liver of pregnancy.
5) Reye's Child <5yrs. dt Aspirin in a child with viral infection esp. chicken pox.
6) Tetracycline IV especially during pregnancy
7) Wilson's disease.

Investigations

1) Liver functions
   - ↑PT.
   - ↑ Bilirubin.
   - ↓ s. Albumin.
2) hepato-cellular damage → ↑ Transaminases,
3) US → ↓ liver size.
4) EEG → grade of encephalopathy
5) Isotope scan → no uptake
6) of the cause → viral - autoimmune markers.

Treatment

a) Treatment of h. encephalopathy. (as before)

b) Treatment of Complications

Complication	Causes	TTT.
• hypo-glycemia	Gluconeogenesis	→IV glucose infusion.
• hypo-natremia	↓ free H_2O excretion	→ Fluid Restriction.
• hypo-kalemia	Diuretics. Glucose → insulin release	→ KCl 10-15 gm/d
Hemorrhage	↓ coagulation factors	→ Vit K + FFP
Infection	↓ complement	→ ABS
Brain edema	disruption of BBB	→ mannitol.
Hepato-renal failure	Lactic acidosis → $NaHCO_3$.	

Important Notes in Liver

p. 1

Liver histology:

1) Liver is divided into 8 segments.
2) Ito cells → Vit. A & D storage + synthesize fibrous t.
3) Kupffer cells → bl. monocytes.
4) Glycogen storage is enough for 24 hrs. ....so Advanced LD → fasting hypo-glycemia.

p. 13

pt. e ↑ Transaminases

1) Viral Markers → hbs Ag / HA Ab / HC Ab.
2) Auto-immune markers → ANA.
3) Cu + Fe^{++} profile.
4) history of hapto-toxic drugs.

p. 19

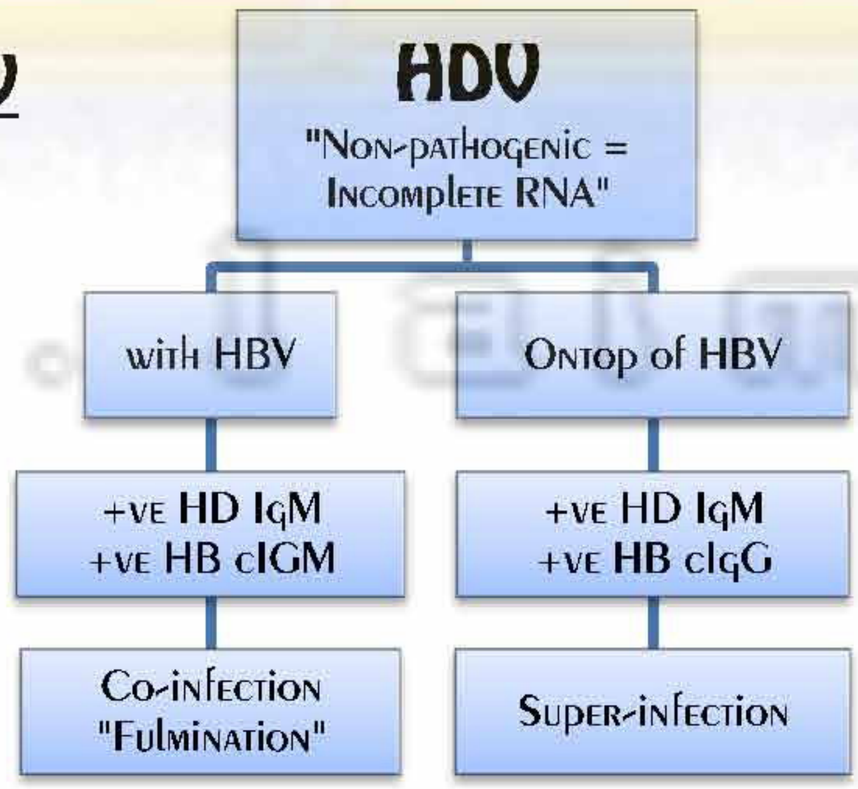
Carrier & Chronic Markers are Almost same so we diff. by....

1) Cl./P
2) Transaminases.
3) Pathology by biopsy.

p. 20

Other hepato-tropic Viruses

1) **HDV**



2) HEV = A شبه + fulmination in pregnancy.
3) HGV = HCV.

p. 21 Just palpable Spleen = few cm BCM.

1) Typhoid → Widal test.
2) Brucellosis → Br. Agglutination test.
3) IMN → paul-bunnel test + mono-spot + EBV Ab.
4) IEC → Echo (Trans-oseoph. For vegitations)
   → Bl. Culture.
5) Viral hepatitis → Transam. + Viral Markers.

p. 25 Non-hepatotropic Viruses:

	CMV	IMN	Herpes Simplex
RF	Immune-comp.	EBV sore Throat + .. Jaundice → hepatitis pallor → AIHA (Cold)	Immune-comp.
Invest.	Intra-nuclear Inclusions. giant cells.	• Atypical Lymphocytosis. • Paul-bunnel – Mono spot (heterophil Ab) Ig (M/G)	Marked ↑↑↑ Transam.
Tit.	Gancyclovir.	No specific tit.	Acyclovir.

p. 26 Pt. Complaining of Easy fatigue

1) Blood → CBC.
2) Liver → SGPT.
3) Kidney → s. Creatinine.
4) Pancreas → RBS.

p. 34 Child classification of Cirrhosis = Functional state of the liver

	A	B	C
1) s. bilirubin	< 2mg /dl	2-3	> 3
2) s. Albumin	> 3.5 mg/dl	3 – 3.5	< 3
3) PT	< 4	4-6	> 6
• Ascites	×	Mild	Sever
• h. Enceph.	×	mild	Sever
• Nutrition.	Excellent	Good.	Poor.
• prognosis	Good	Fair	poor

p. 36

Haemo-chromatosis

	1ry Hemo-chromatosis	2ry = Hemo-sidrosis
	Hereditary.	Acquired.
Causes	↑ Fe absorption from SI in absence of mucosal block.	CHA + Repeated bl. Transfusion. (Th. Major)
Fe dep.	In parenchyma → sever damage. Pancreas is affected.	In RES → less damage. Pancreas is spared.

p. 39

Factors ↑ Risk of Alcoholic

1) *F > M.* *HBs Ag* *HLA ass.*
2) *Dose & duration.* *Malnutrition.* *Immunolog. Mech.*

p. 38

Blood & Liver

1) Alcohol LD → Macro-cytosis Non-Mgalo-blastic.
2) Chronic LD → Macro-cytosis.
3) Chronic Advanced LD → Acanthocyte.

p. 40

Chronic Itching

1) 1ry Biliary Cirhosis → ALP & γ GT.
2) Uremia → KFTs.
3) DM → Bl. Sugar.
4) Leukemia → CBC
5) Lymphoma → if Alcohol intake.
6) Polycythemia → if hot bath.
7) Hemolysis → hb + D. bilirubin.

p. 40

Liver D + Arhtropthy

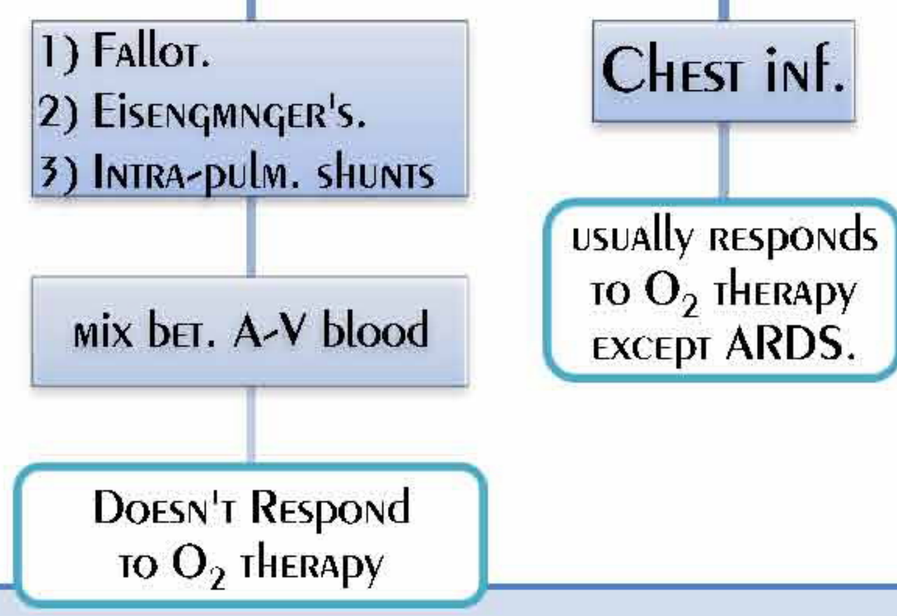
- Viral - Auto-immune hepatitis.
- Haemocromatosis - Wilson's D - 1ry Biliary cirrhosis.

p. 42

DD of 1ry Biliary Cirrhosis PBC & PSC

	1ry Biliary Cirrhosis	PSC = 1ry Sclerosing Cholangitis
Cause	• Auto-immune.	• Auto-immune.
Path.	• Intra-heaptic obst. Only.	• Intra & Extra-hepatic Obst. → Biliary Cirrhosis.
Sex	• Females.	• Male = females.
Cl./P	• Itching **then** Jaundice.	• Itching **with** Jaundice.
Invest.	+ve AMA.	• -ve AMA • +ve ANCA as Wegner's Granuloma.
TTT.		Un-satisfactory bec. v. aggressive (Steroids ± Liver transplant)

p. 43 ..... Hypoxia & Cyanosis dt



p. 62 Fibro-lamellar Carcinoma

- *Variant of HCC.*
- *young age with No RF. (no cirrhosis or HBV / HCV)*
- **Invest:**
  - a) -ve αFP.
  - b) **Sonar** → *HYPER-ECHOIC LEASION.*
  - c) **Biopsy** → *MALIGNANT HEPATOCYTES IN DESE LAMELLAR FIBROUS T. STROMA*
- **Better prognosis than hepatoma.**

p. 61 Hepatoma Markers

a) ↑↑↑ αFP → hepatoma only.

b) α FP + CEA → 2ry metastasis in liver dt Colorectal cancer.

p. 63 Fatty Liver (hepatic Steatosis)

liver ++ dt hepatic infiltration e neutral fat

Macro-vascular: good
- a) *Alcohol.*
- b) *Obesity.*
- c) *DM (Type II)*
- d) *TPN*

Micro-Vascular: → fulminate failure
- a) *Acute fatty liver of pregnancy.*
- b) *Reye's $.*
- c) *Teracyclin toxicity.*

Cl./P:

1) *Of the cause.*
2) *Enlarged tender liver → Rt. Hypo-chondrial pain.*
3) *Fulminate failure in the above causes.*

Invest.:

1) of the cause → *eg. Bl. Sugar.*
2) **Sonar** → *enlarge homog. Liver.*
3) **Biopsy** → *diagnostic (but not needed)*
4) **Trans-Aminases** → *mild ↑.*

ttt.:

1) Of the cause. + Restriction of fat + CHO.
2) Lipotropic drugs + of fulminant failure.

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Jaundice

Familial Jaundice	Recurrent Jaundice
1) *Gilbert $.* *(Un-Congugated)* 2) *Crigler Najjar $.* *(Conjugated)* 3) *Dubin Johnson$.* *(Conjugated)* 4) *Inherited hemolytic anemia.* 5) *Wilson's disease.* 6) *Hemochromatosis.* 7) *Cholestasis of pregnancy.*	1) *Hemolytic.* 2) *Wilson's disease.* 3) *Gilbert's with fasting.* 4) *Cholestasis of pregnancy.* 5) *Gall stones.* 6) *Peri-ampullary carcinoma.*
Painful Jaundice	**Painless Jaundice**
1) *Calcular jaundice (Gall stones).* 2) *Hepatitis.* 3) *Cancer head pancreas* 4) *Congested liver* 5) *Hepatoma, fibrolamellar carcinoma*	1) *All familial jaundice.* 2) *Any type of cirrhosis.*

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Liver D + pleural effusion:

1) Amebic liver abscess → Rt. pleural.
2) Cirrhotic Ascites → Rt pleural.
3) Cirhotic Ascites + Lt. sided eff. → TB if DM + pneumonia.
4) Cirrhotic Ascites + Bilateral eff. → hypo-protenemia.

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SBP = Sub-Acute Bacterial Peritonitis

CLP	Liver Cirrhosis + Ascites → fever + h. enceph. (e our ppt. factors) → SBP.
CA	E. coli – Klebsiella – Entero-cocci.
Route	Blood.
Invest.	• Aspiration → C & S. • WBCs in Ascitic fluid > 500 /m³ (> 250 PNL / m³)
TTT.	3rd G CS.

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Vascular Liver D.

	Portal Vein Thrombosis	Budd Chiari $
Causes	1) Polycythemia. 2) Tumors (pancreas / hepatoma) → compress PV. 3) Umbalical sepsis.	Hepatic V. Thrombosis dt (دم ثقيل) 1) Polycythemia Rubra Vera. 2) OCP. 3) Hyper-coagulubal state. (↓ AT-III & protein C, S) 4) PNH. "complement"
Cl./P	1) PH..... 2) Transient Ascites (dt opening of collaterals)	1) Rt. Hypochondrail pain. 2) Tender hepatomegaly. 3) –ve hepto-jugular R. "No cong. Neck veins to diff. from RVF or TI"
Invest.	Duplex scan	
TTT.	1) Of the cause. 2) heparin 3) Surgery in Budd Chiari $.	

- **Veno-Occlusive** → as Budd Chiari but Cenral vein.
- **Cardiac Cirrhosis** → dt long standing RVF / Constrictive Peri-carditis.

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DD of Enlarged Tender Liver (V. Imp.)

1) **Hepatitis** → ENZYMES , MARKERS, ...
2) **Amoebic liver** → US,...
3) **Fatty liver** → US, ...
4) **Hepatoma** → US, AFP.
5) **Congested liver** RVF → CONGESTED NECK V., LL EDEMA.
   BUDD CHIARI $ → NO CONGESTED NECK VEINS.