

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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Viral Hepatitis

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~~HAV. HBV~~, HCV. HDV HEV
and HGV

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HEPATITIS C



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HEPATITIS C



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- Hepatitis C is a **contagious** liver disease
- caused by the hepatitis C virus (HCV):
- ❖ HCV can cause both **acute** and **chronic** hepatitis,
- Severity rang ,**mild illness** lasting a few weeks **to a serious, lifelong illness**
- During the **Acute Phase** , about:
- **80 %** have no symptoms
- ❖ **15–45%** of infected persons **spontaneously clear** the virus
- ❖ within **6 months** without any treatment.
- ❖ The remaining **55-85 %** ,develop **chronic HCV** infection.
 - **15–30%** of those chronic HCV have a risk of
 - developing **liver cirrhosis** within **20 years**.
- **HCV** is much **more** likely than HBV to **become a chronic infection**
- Antiviral medicines can cure **more than 95%** of persons with H C infection, but access to diagnosis and treatment is low.
- thereby reducing the risk of death from liver cancer and cirrhosis

Globally

- ❖ Worldwide, **more** than **170 million** persons have HCV infection,
- ❖ of whom **71 million** have **chronic** infection.
- ❑ with about **1.5 million new** infections occurring **per year**.
- ❑ WHO estimated that in 2019, approximately **290 000 people died** from hepatitis C, mostly from cirrhosis and HCC (primary liver cancer).

Hepatitis C is found worldwide. The most affected regions are WHO

- WHO **Eastern Mediterranean and European Regions**, with the prevalence of **2.3%** **and** **1.5%** respectively.

in other WHO regions the prevalence of HCV infection ranging 0.5 - 1.0%. Depending on the country,

- ❑ **HCV** infection, can be concentrated in certain populations (e.g, among people who inject drugs) and/or in general populations.

- ❑ **There are several genotypes of the HCV virus & their distribution varies by region**

TRANSMISSION



- ❑ The HCV is a **blood borne virus**
- ❖ HCV is most commonly transmitted through
 - **exposure** to infectious blood. This can occur through
 - (a) **Receipt of contaminated blood transfusions, blood products** (*unscreened blood and blood products*) and **organ transplants**;
 - (b) **Injections** given with **contaminated** syringes and **needle-stick injuries** in health-care settings;
 - (c) **Reuse or inadequate sterilization** of medical equipment, especially syringes and needles in healthcare settings
 - (d) **Injection drug users (IVU)**
 - (e) **HCV -infected mother to new-born baby**
 - (f) **sex** with an infected person or
 - (g) **Sharing of contaminated personal items** .
- **No** spread through breast milk, food or water, or by casual contact such as hugging, kissing and sharing food or drinks with an infected person.

but these are less common.

SYMPTOMS

Following initial infection, approximately

➤ **80%** of people **do not** exhibit any symptoms.

☐ Those people who are acutely symptomatic may

➤ fever, fatigue, decreased appetite, nausea, vomiting, abdominal pain, dark urine, grey coloured faeces, joint pain and jaundice.

❖ About **55-85%** of newly infected persons develop **chronic disease** and

➤ **60- 70%** of chronically infected people

➤ develop **chronic liver disease**;

✓ **15-30%** develop **cirrhosis** and

✓ **1-5%** die from **cirrhosis** or **liver cancer**.

❖ In **25%** of liver cancer patients, the underlying cause is hepatitis C.



Liver disease progression in Hepatitis C virus infection,

Incubation Period

for HCV is **2 Wks to 6 Mths**.

Diagnosis



- ❖ Diagnosis of acute infection is
- ❖ **often missed** because a majority have **no symptoms**.
- ❖ Common methods is **antibody** detection **cannot** differentiate between **acute and chronic infection**.
- ❖ In chronic HCV infection, is also often **undiagnosed**
 - because remains **asymptomatic** until **decades** after infection when **symptoms** develop **secondary to serious liver damage**.
- ❑ **HCV infection is diagnosed in 2 steps**
- ❖ The presence of **antibodies** against HCV (anti-HCV)
- ❖ **indicates** that a person is **infected** or **has been infected**.
- ❖ The HCV recombinant immunoblot assay (RIBA)
 - Present HCV Abs in the blood for **more than six months** is a **Because about 30% of HCV infected people ,spontaneously clear the infection** by a strong immune response without the need for treatment. So they will still test **positive** for **anti-HCV Abs**

- ❖ So they will still test **positive** for **anti-HCV Abs** although no longer infected, and diagnosis of **chronic infection**
- ❖ **HCV RNA by RT-PCR** used to **confirm** the diagnosis.
- ❖ Diagnosis is **confirmed by liver biopsy** or
- ❖ **variety of non-invasive** tests for assessment of the
- ❖ **degree of liver damage** (fibrosis and cirrhosis). .

- ❖ In addition, **identify the genotype** of **HCV** should be done
- There are **7 HCV** genotypes with their several subtypes and they **respond differently to treatment**.
- **The distribution of these** HCV genotypes varies by region
- A person may be infected with **more than 1 genotype/** subtypes
 - ❖ The degree of **liver damage** and **HCV genotype** are used to
 - ❖ **guide treatment decisions and management of the disease**

Early diagnosis

- ✓ **can prevent** this health problems and
- ✓ **prevent transmission** to family members and other close contacts

WHO & Some countries recommends screening for

people at increased risk **These include:**

(a) People who **received blood, blood products** or **organs**

before screening for HCV was implemented,

(b) **Current** or **former** injecting **drug users** (even those who **injected drugs once** many years ago

(c) People on long-term **haemodialysis**;

(d) **Health-care workers**;

(e) People **living with HIV**;

(f) People with **abnormal liver tests** or liver disease,

(g) **Infants** born to infected mothers.

(h) People with **sexual partners** who are **HCV-infected**;

(j) People who have had **tattoos or piercings**.

(k) People who use **intranasal drugs**

Treatment



- ❑ Hepatitis C does not always require treatment.
- ❖ **The cure rate** depends on several factors including the **HCV** genotypes and the type of treatment given
 - **Careful screening is necessary** before starting the treatment to determine the most appropriate approach for the patient.
- ❑ **Combination antiviral** therapy with **interferon** and **ribavirin**
 - **Some virus genotypes respond better to interferon than others,**
Currently, the Pan genotypic direct acting antivirals(**DAAs**) for the treatment of chronic hepatitis C are approved for the treatment of HCV-infected persons without cirrhosis. for persons over the age of 12 years. DAAs can cure most persons with HCV infection, **& treatment duration** is short (usually **12 to 24 weeks**), depending on the absence or presence of cirrhosis.

Prevention

Primary prevention

vaccine for hepatitis C.

There is no

☐ Therefore HCV **prevention depends** upon **reducing the risk** of exposure in **higher risk populations including HCWs**

☐ **Training of health personnel hand hygiene:** including surgical hand preparation, hand washing and **use of gloves**

Following are limited examples of **primary prevention**

☐ **avoiding the risk factors** as recommended by WHO

❖ **Unnecessary and unsafe injections**

✓ **safe & appropriate use of health care injections**

❖ **Unsafe blood products**

✓ **testing of donated blood for HB , HC & HIV**

❖ **Unsafe sharps waste collection and disposal**

✓ **safe handling and disposal of sharps and waste**

Unprotected sex with HC -infected people

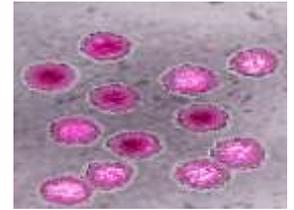
Cont. examples of primary prevention

- ❖ **Unprotected sex with HC -infected people;**
 - ✓ **promotion use of condoms**
- ❖ **Use of illicit drugs and sharing of injection equipment**
 - ✓ **Provision of comprehensive harm-reduction services to people who inject drugs including sterile injecting equipment;**
- ❖ **Sharing of sharp personal items that contaminated with blood**
- ❖ **tattoos, piercings & acupuncture performed with contaminated equipment.**

❑ **Secondary and tertiary prevention**

For people infected with the HCV , **WHO recommends:**

- ✓ **education** and counselling on options **for care and treatment;**
- ✓ **Immunization** with the hepatitis A and B vaccines to prevent co infection from these hepatitis viruses to protect their liver,
- ✓ **Early and appropriate medical management** including antiviral therapy
- ✓ **Regular monitoring** for early diagnosis of chronic liver disease.



HEPATITIS D

- HD is a liver disease in **both acute and chronic forms**
- caused by HDV ,
- HDV also called Delta agent
- is similar to other forms of hepatitis, **BUT**
- it can only infect those who are **already infected with the HBV.**
- It requires HBV for **its replication**
- cannot occur in the absence of HBV
- **HDV-HBV co-infection** is considered the **most severe** form of chronic viral hepatitis due to **more rapid progression** towards **HCC and liver-related death.**
- ❑ **Chronic HBV carriers** are at **risk of infection** with HDV.
- ❖ **People who are not immune to HBV** (either by natural disease or immunization with the hepatitis B vaccine) are **at risk of** infection with HBV, which puts them at **risk of HDV infection.**
- ❑ **A HBV vaccine is the only method to prevent HDV infection**
- ❑ **Hepatitis D should** be considered in cases of **acute liver failure** or when a patient who is a known hepatitis B carrier suffers an **acute exacerbation.**

❑ **Hepatitis D should** be considered in cases of **acute liver failure** or when a patient who is a known hepatitis B carrier suffers an acute exacerbation.

The infection has two forms:

▪ **Co-infection or **Super-infection**

Super-infection

- ✓ HDV infection **occurs after** person is already infected with **HBV**
- ✓ **Super-infection** with HDV acts more like HB and can go on
- ✓ **to cause** cirrhosis & death
 - ✓ **Super infection** is usually suspected when someone
 - ✓ **with hepatitis B becomes increasingly ill rapidly**
- ✓ ...
- ✓ ...

Co-infection ;

- ❖ individual **simultaneously** infected with both HDV & HBV
- ❖ **It is usually acute (similar to a hepatitis A infection**
- ❖ **HDV-HBV co-infection** is considered the
- ❖ **most severe form of chronic viral hepatitis** due to rapid progression towards **liver-related death & HCC**
-
-
- ...

Geographical distribution

- **Worldwide,**
- The overall No of HDV infection **has decreased** since **1980s. ??????**
- mainly due to a **successful global HBV vaccination** programme.
- HDV is found **throughout the world** but with a not uniform distribution.
- ❖ It is estimated that **5%** of chronic HBV with HDV, infection
- ❖ Resulting in a total of **15 – 20 Million** persons infected with HDV WW
- ❖ The global estimation and geographic information **are incomplete** because many countries do not report the prevalence of HDV
- **Its highest** prevalence has been reported in Italy, the Middle East, Central Asia, West Africa and South America.
- **Middle East (all countries)**

Two epidemiological patterns

❑ **Two epidemiological patterns** of HDV infection have been identified

❖ In **Mediterranean countries**, HDV infection is **endemic among** persons with HB,

❖ In **United States** and northern Europe is **non endemic areas**, HDV infection is **confined to persons exposed frequently to blood and blood products, IVDUs and haemophiliacs**

Incubation Period

➤ **Varies from 2-12 weeks,**

➤ **Being shorter in HBV carriers who are superinfected** with the agent,

➤ **than** in susceptible persons who are **simultaneously** infected with both HBV & HDV.

Transmission

❑ **HDV infects all ages.**

- Persons who have received **multiple transfusions**,
- **intravenous drug abusers**, and their
- **close contacts are at high-risk**

❑ **The primary route of transmission are similar to HBV&HCV**

- Infection is **dependent on HBV replication**,
- **as HBV provides an HBsAg envelop for HDV**

❖ **Percutaneous through contact with infected blood or blood products or other body fluids of an infected person.**

○ **HDV does not transmitted sexually**

○ **Vertical transmission is possible but rare.**

❖ **Vaccination against HBV prevents HDV co infection**, and

❖ **Hence expansion of childhood HBV immunization programmes has resulted in a lower HDV incidence worldwide**

❖ **However, vaccination does not protect HB carriers from super infection by HDV**

Symptoms

Acute hepatitis:

- ❖ Simultaneous infection with HBV and HDV can lead to
- ❖ **a mild-to-severe**
- or even **fulminant hepatitis**, but
- **Recovery** is **usually complete** and
- ❖ **Development of chronic HD is rare** (<5% of acute hepatitis).

Super infection:

- ❖ HDV can infect a person already chronically infected with HBV.
- The **super infection of HDV on chronic HB**
- **accelerates progression** to a
- **more severe** disease **in all ages** and in **70–90%** of persons.
- ❖ HDV super infection **accelerates progression to cirrhosis** almost a **decade earlier** than HBV non co infected persons, although HDV suppresses HBV replication.
- ❑ *The mechanism in which HDV causes more severe hepatitis and a faster progression of fibrosis than HBV alone remains **unclear**.*

Who is at risk?

- **Chronic HBV carriers** are at risk for infection with HDV.
- People who are **not immune to HBV** (*natural disease or HB vaccine*)
- High prevalence in persons **who inject drugs** injecting drug use is an important risk factor for HDV co-infection.
- High-risk **sexual activity** (e.g. sex worker)
- Migration **from high HDV** to lower prevalence areas might have an effect on the epidemiology of the host country

Screening and diagnosis

❖ HDV is diagnosed by high titres of **IgG** & **IgM** anti-HDV, and

Confirmed by detection of **HDV RNA** in serum.

HBsAg is useful to monitor treatment response

if quantitative HDV RNA is not available.

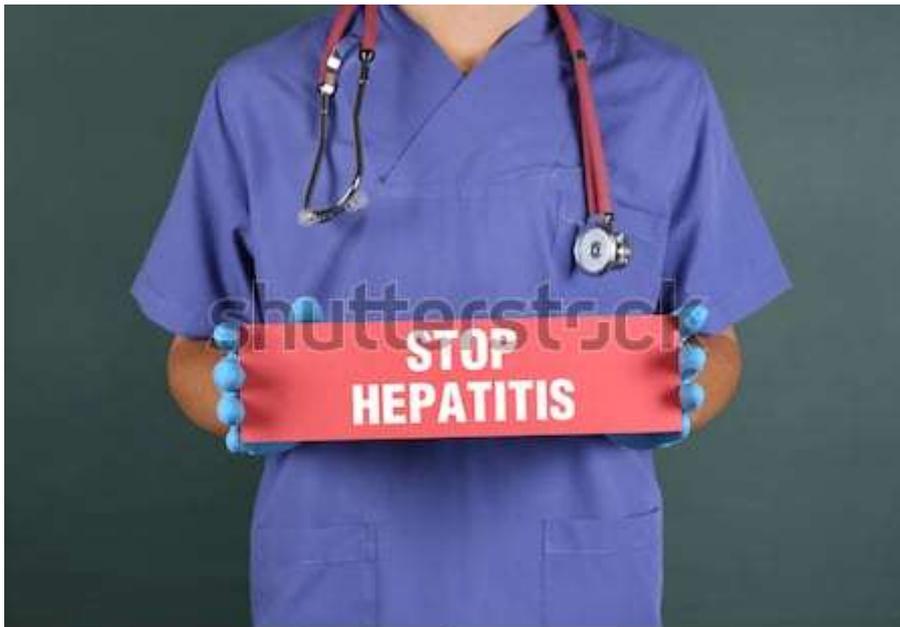
❖ **Decreasing** HBsAg titers often **means** surface **antigen loss** and

✓ **HDV clearance**, although surface antigen loss is rare in treatment.



A BIG
THANK
YOU!

HEPATITIS E



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