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## Intra familial transmission of hepatitis B&C virus

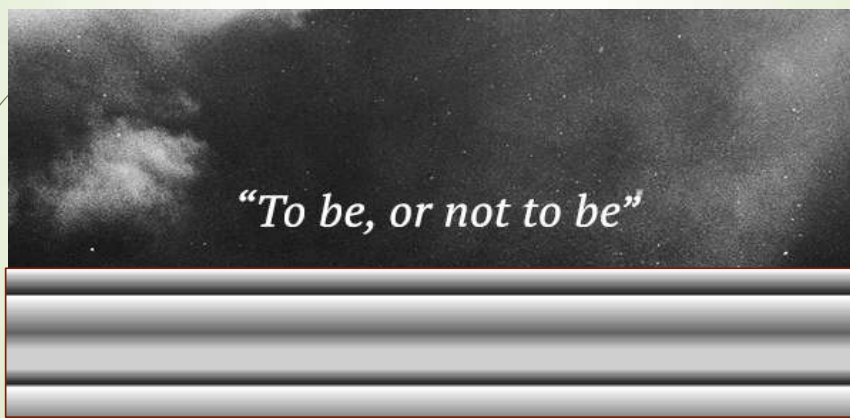
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4/20/2021

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## Important Question



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## Key points:

- definition
- Prevalence
- diagnosis
- Different routes of transmission and risk factors
- prevention



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## Definition

- transmission between patients infected with hepatitis and their
  - household members (siblings, offspring and parents)
  - stable heterosexual partners

# HORIZONTAL VS. VERTICAL



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## Prevalence

- **Fars:** In 18 out of 34 families, HCV antibody was detected (52.9%) in new members
- **Arak:** intra familial house hold contact with HCV positive cases has no effective role in transmission of HCV, Mothers and children with 47.6% and 17.2% had the highest and lowest rates of HBV infection
- **Nahavand:** Higher rates of HBsAg marker were detected in the brothers (1-25%) and fathers (1-12.5%).

اولین همایش ملی مدیریت و کنترل عفونت‌های منتقله از خون (پنجمین کنفرانس هیپاتیت مشخصه MHC5)

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## Prevalence



- **Zahedan:** it was more prevalent in mothers of index cases compared to their spouses, suggesting more efficient mother-to-child than sexually transmission of HBV
- **Guilan:** significant difference in the prevalence of Hepatitis B in the general population and family members of Hepatitis B patients

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## Prevalence in world



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## Diagnosis



- ▶ The certain diagnosis of horizontal intra familial transmission of hepatitis is based on:
  - the simultaneous presence of specific laboratory criteria,
  - the temporal association between intra familial exposure and infection
  - and the exclusion of all the potential extra-familial routes of transmission of the infection.

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## Different routes of transmission



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## Different routes of transmission

**Non-  
sexual  
contact  
vs. Sexual  
contacts**

**Horizontal  
vs.  
vertical**

**siblings,  
offspring  
parents  
heterosexual  
partners**

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## Risk factors of transmission

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## Risk factors of transmission



- ❑ Contrary to the experience with HBV, the issue of familial acquisition of HCV has not been resolved.
- increased risk for HCV infection exists in :
  1. Siblings and household contacts of HCV-infected CLD patients.
  2. Offspring of HCV carriers in endemic areas.
  3. Spouses of HCV carriers in non-endemic areas. Male partners of HCV-infected females may be more susceptible to HCV infection than female partners of HCV-infected males.

➤ Ref: Intrafamilial transmission of hepatitis C virus: a systematic review 4/20/2021 Journal of Viral Hepatitis, 2000

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## Risk factors of transmission



- The increased risk for HCV infection in families and spouses in the controlled studies was reported to correlate with:
  1. The severity of liver disease in the index patients.
  2. The number of family members infected with HCV .
  3. The duration of exposure to the index patient.
  4. Sexual contact with the index patient.

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## Risk factors of transmission

- Domestic risk factors for HCV transmission were identified in the uncontrolled studies:
  - Sharing razors and nail scissors between family members and patients, and reuse of syringes
  - Co-infection with human immunodeficiency virus (such co-infection, probably by raising HCV titers, facilitated HCV transmission to the spouse.
  - Duration of marriage .The risk of HCV infection for the spouse was increased only after 15 years.

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## Risk factors of transmission

- **perinatal transmission of HBV**: in the Middle East, has been proposed not to play major roles. In a Western Brazilian population, offsprings represented the least rate of HBsAg positivity compared to other family members.
- **Sexual transmission**: In the Middle East, sexual contact has been reported a significant path of HBV spread
- **Non-sexual horizontal transmission (non-hygienic behaviour )** such as:
  - ✓ shared used of toothbrush and nail clippers
  - ✓ contact during play
  - ✓ exposure of open wounds
  - ✓ sharing towels and razors
  - ✓ exchange of chewing gum and candies

A Global Perspective on the Intrafamilial Transmission of Hepatitis B Virus Infection, 2012,3(1)1, 22-28/20/2021



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## Risk factors of transmission

- ▶ **Cultural and behavioral issues:**
- ▶ in an Iranian study found that in non-vaccinated study participants:
  - ear piercing,
  - phlebotomy
  - and rural life

**STILL PLAY SIGNIFICANT ROLES IN THESE FAMILIES**

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## Risk factors of transmission

- ▶ co-infections in particular families does not essentially show transmission of the infection between family members and
- ▶ shows that the higher incidence of HBV infection in these families might be due to higher incidences of risky behaviors in these families

Ref: A Global Perspective on the Intrafamilial Transmission of Hepatitis B Virus Infection, 2012;3(1)1, 22-26

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## Risk factors of transmission

- ▶ In Egypt, Transmission of hepatitis c was associated with:
  - ▶ older age and
  - ▶ contact with patients with hepatic encephalopathy
  - ▶ and was high among husbands of infected wives

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Key and priority populations	Hepatitis B	Hepatitis C
<b>Infants born to infected mothers</b>	Perinatal or early childhood transmission is the main route of infection in many parts of the world, particularly in endemic countries, where 90% of CHB infections may be attributable to MTCT.	MTCT is the most common cause of HCV infection in young children. Risk of HCV transmission is 4–8% in the perinatal period, and 10%–25% among children born to mothers coinfecting with HIV (96–99).
<b>Children</b>	Horizontal (household, intra-familial and child-to-child) transmission is an important route of infection. Up to 50% of childhood CHB infections cannot be accounted for by MTCT of	Based on limited data, horizontal transmission does not appear to be a significant contributor to HCV transmission in children (100).
<b>Couples, partners and household contacts</b>	Persons who live in the same household as a person with CHB are at increased risk of horizontal acquisition of HBV infection (103).	Overall, the risk of sexual transmission of HCV is low. However, the risk is increased among persons with multiple sex partners (59, 102, 104).  There is no evidence to support transmission among household contacts who are not sexual partners (100).

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WHO guidelines on hepatitis B and C testing

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## Prevention for hepatitis B

- ▶ national vaccination program

After implementation of universal vaccination program in Iran since 1993, the rate of new infection is reduced and the risk factors of acquiring HBV infection have changed from vertical or early childhood to adolescents

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## Prevention for hepatitis B

- ▶ screening of pregnant women for serological markers of HBV. Therefore, disruption in the chain of mother to infant transmission by continuing the universal vaccination program could remove this main route of transmission
- ▶ Immunization of babies born to HBsAg positive mothers
- ▶ precautions for hepatitis B patients family members (contact precautions)

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## Prevention for hepatitis C

- There's no vaccine for hepatitis C
- avoiding needle/syringe sharing
- using a barrier method (sexual barrier use)
- precautions for hepatitis C patients family members (contact precautions)

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## Recommendation for future studies

- ✓ prospective cohort studies in studies of large populations
- ✓ families who only have one HBV carrier case, and other members have been confirmed negative for HBV at the entrance to the study should be considered.
- ✓ phylogenetic study
- ✓ good monitoring to rule out getting the infection for index and contacts from the same source outside the family
- ✓ controlled studies

➤ Ref:

- A Global Perspective on the Intrafamilial Transmission of Hepatitis B Virus Infection
- Role of intrafamilial transmission in high prevalence of hepatitis C virus in Egypt

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