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Using Public Health Surveillance Data to Determine Hepatitis C Virus Exposure Among Live-Born Infants

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ABSTRACT

Hepatitis C virus (HCV) poses a significant public health challenge, especially with the rising incidence among women of childbearing age. This review explores the utility of public health surveillance data to identify and manage HCV exposure in live-born infants. Current strategies for maternal screening, infant follow-up, and surveillance data utilization are discussed, emphasizing gaps in policy and practice. The findings advocate for robust, standardized frameworks to mitigate vertical HCV transmission and improve neonatal outcomes.

Introduction

Hepatitis C virus is a leading cause of chronic liver disease globally, with approximately 71 million people affected (World Health Organization, 2020). The increasing prevalence of HCV among women of childbearing age raises concerns about vertical transmission. Transmission rates range from 5-10%, primarily affecting infants born to mothers with active viremia . Despite advances in antiviral therapies, gaps in maternal screening and neonatal follow-up persist.

Public health surveillance systems can play a pivotal role in identifying at-risk populations and guiding interventions. This review highlights the importance of leveraging surveillance data to assess HCV exposure among live-born infants and proposes strategies to optimize care pathways.

1.Epidemiology of Maternal HCV Infection

The prevalence of HCV in pregnant women has risen in tandem with the opioid epidemic, particularly in North America. In the United States, the Centers for Disease Control and Prevention (CDC) reported a 163% increase in HCV infections among women aged 15-44 from 2006 to 2018 (1). Key risk factors include:

- Intravenous drug use.
- Socioeconomic disparities.
- Limited access to prenatal care.

These trends underscore the urgent need for comprehensive maternal HCV screening.(2)

2. Vertical Transmission of HCV

Vertical transmission occurs when the virus passes from an infected mother to her infant during pregnancy or delivery. The risk is heightened in mothers with co-infections (e.g., HIV) or high viral loads (2). Without timely intervention, exposed infants may develop chronic HCV, leading to long-term liver complications.

3. Role of Public Health Surveillance

Public health surveillance data can identify trends in maternal HCV infections, track neonatal outcomes, and inform targeted interventions. Key functions include:

- **Maternal Screening Data:** Identifying HCV-positive pregnancies for early intervention.
- **Neonatal Follow-Up:** Tracking exposed infants to ensure timely testing and treatment.
- **Policy Development:** Informing evidence-based guidelines for prenatal and postnatal care.

5. Current Challenges

- **Inconsistent Screening Policies:** Not all countries mandate HCV screening during pregnancy, leading to underdiagnosis.
- **Data Gaps:** Variability in data collection methods across jurisdictions limits the utility of surveillance systems.
- **Barriers to Follow-Up Care:** Many HCV-exposed infants do not receive the recommended postnatal testing, often due to socioeconomic constraints (3).

6. Recommendations for Improvement

✓ **Universal Maternal Screening:**

- Implement routine HCV testing for all pregnant women.
- Provide access to direct-acting antiviral (DAA) therapy for eligible mothers.

✓ **Strengthen Neonatal Follow-Up:**

- Develop standardized protocols for testing and monitoring HCV-exposed infants.
- Address healthcare access disparities to ensure continuity of care.

✓ **Enhance Surveillance Systems:**

- Integrate maternal and neonatal HCV data into centralized public health databases.
- Promote data-sharing among healthcare providers, public health agencies, and researchers.

7. Recent Advances in HCV Management

The advent of DAAs has revolutionized HCV treatment, achieving cure rates exceeding 95%(4,5). While DAAs are not yet approved for use during pregnancy, ongoing clinical trials show promise. Additionally, advancements in neonatal testing methods, such as RNA PCR assays, enable earlier and more accurate detection of HCV in exposed infants.

Conclusion

Public health surveillance systems are indispensable for identifying and addressing HCV exposure among live-born infants. However, significant challenges remain, including inconsistent maternal screening policies and barriers to neonatal care. By strengthening surveillance frameworks, enhancing access to care, and leveraging emerging therapeutic options, healthcare systems can reduce vertical HCV transmission and improve outcomes for affected families.

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