Hepatitis A in Jerusalem: An exception which proves the rule?

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Topics

- Hepatitis A Background
- Hepatitis A outbreaks 1990’s and mass vaccination
- Jerusalem district Hepatitis A epidemiology
- Hepatitis A outbreak in Jerusalem 2007
- Hepatitis A and Immunization coverage
Hepatitis A Background
HEPATITIS A VIRUS INFECTION

- Incubation: Av. 28 days, Range 15-50 days
- Acute disease, asymptomatic infection
- No chronic infection rare complications
- 0.5% acute liver failure, mortality >40y - 2.1%
- Transmission: role for children
- Close personal contact, Day care, kindergartens, International Travel, Contaminated food/water

Jaundice by age group

Hepatitis A. Epidemiology and Prevention of Vaccine-preventable Diseases
Epidemiology shift & Hepatitis A outbreaks

- Countries with intermediate HA rates.
- Hepatitis A outbreaks emerge in defined low s-e level communities.
- Difficult to control despite preventive measures.

The District Health Offices in Israel
Field epidemiology and outbreak control

- Epidemiology – descriptive and analytic
- Infectious Diseases Surveillance
- Notifiable Infectious Diseases
- Laboratory-based surveillance
- Epidemiologic investigations
- Data collection and analysis
- Outbreak alerts
- Prevention and Control measures
Hepatitis A outbreaks 1996-2000
Jisr az -Zarqa  (bridge over the blue)
Haifa District Hadera sub-district
The community - an Arab village of a poor socioeconomic level.

- 8000 inhabitants, 1200 households.
- **August 1996**
- 96 HA cases.
- 87% - children **aged 12-72 months**.
- 6 (6.3%) - hospitalized.
- 1 emergency liver transplant.
Control of a community-wide Hepatitis A outbreak by mass active vaccination

Zamir et al, EJCMID 2001

Week of outbreak (week 1 = 18-24 August 1996)
Mass Immunization
HA outbreak 1999

- 30 months without HA cases
- **July 1st 1999**: Routine vaccination of toddlers born 1/1/98 and later (1998 cohort) was started in the village as part of the national program.
- **August 1999**: 2nd outbreak
- 65 cases, 90% 1996-1997 unvaccinated cohort
- 9 (13.8%) - hospitalized - all recovered
Hepatitis A cases and vaccination 1996-2004

A. Mass HA vaccination
B. Routine HA vaccination
C. Catch-up + modified HA schedule

Last HA case 6/2000
Lessons: Hepatitis A outbreaks

- Hepatitis A vaccine mass immunization during community-wide outbreaks - safe & effective.
- Sustaining high immunization coverage => herd immunity - preventing further outbreaks.


Prevention of Hepatitis A Through Active or Passive Immunization

Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Effectiveness in Populations
…routine vaccination of children living in these communities was feasible and that when relatively high vaccination coverage was achieved and sustained, ongoing epidemics were interrupted and a reduction in disease incidence was sustained.

Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP).
Advisory Committee on Immunization Practices (ACIP), Fiore AE, Wasley A, Bell BP.
Immunogenicity, efficacy, and effectiveness

vaccination. In Israel, a community-wide outbreak of hepatitis A in a socioeconomically deprived setting was completely interrupted within a few weeks following 1 dose of inactivated hepatitis A vaccine administered to >90% of the paediatric population.17
Hepatitis A in Jerusalem
Jerusalem District

- **District population** 1,130,000
  (14% of the national population)
- Jerusalem - largest city in Israel
- Children 0-14y  35%
- Median age  23.5 y
- Live births (2012)  31,000
- **Socio-economic** category 4/10 (96.4%)
- 30% of the population - Arabs
- 70% of the population - Jews
Data Source: Jerusalem district health office, Dep. Epidemiology and ICDC, Ministry of Health, Israel
HA incidence rate/100,000 1990-2012

Data Source: Jerusalem district health office, Dep. Epidemiology and ICDC, Ministry of Health, Israel
HA cases Jerusalem district 2002-2012

![Bar chart showing HA cases for Arabs and Jews in the Jerusalem district from 2002 to 2012.](chart.png)

- **ARABS**
- **JEWISH**
HA outbreak 2007

- 1-5/2007 5 cases/ month
- June-Sep. 2007 : 15 cases/ month.
- Most patients (49/60, 81.7%) adolescents.
- Mean age 15.1±7.5 y Median 13.7 y
- None<5y
- 51.7% males
- Clinical features: jaundice (91.7%), fever >37.5 °C (78.3%), nausea (90%), vomiting (76.7%), abdominal pain (95%), elevated liver enzymes (SGOT: 1420±1051, LDH:1532.5±1191.7, AP: 434±110.5).
- Hospitalization rate (56.7%) x 13 vs. 2000-2006 4.3% average
- All unvaccinated [incl. 9 < 9 y (15%)].
• **Households:** 41 - 1 case, 8 - 2 cases, 1 - 3 cases.
• 301 household contacts —164 children, 137 adults.
• 29 asymptomatic household contacts - tested post-exposure; 16 (55.2%) - HA IgG-positive.
• HA IgG-positive contacts (27.3±17.9 y) older than IgG negative contacts (13.2±5.8 y).
• summer school holiday period.
• 44 (73.3%) reported having consumed various food items from different street vendors.
• 16 lived in SC northern Jerusalem (estimated population 45,000).
• 2004–2007, 1/3 hepatitis A cases in Jerusalem.
HA outbreak 2007 Control

- a targeted catch-up immunization campaign.
- 496 children (18 m - 9 y) immunized.
- School campaign.
- Susceptible household contacts - hepatitis A vaccine as post-exposure prophylaxis.
- Within 4 weeks no further cases;
- since October 2007 n. cases < 3 per month.
Age specific incidence 2000-2012

Jews

Arabs

0-9
10-19
+20

0 20 40 60 80 100 120 140 160 180 200

0 10 20 +
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<tr>
<th></th>
<th>1990's</th>
<th>2000's</th>
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<tr>
<td><strong>age</strong></td>
<td>1-6 years</td>
<td>10-19 years</td>
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<td><strong>unvaccinated</strong></td>
<td>+</td>
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<td>kindergartens</td>
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<td><strong>Control measures</strong></td>
<td>Mass vaccination, Catch up vaccination</td>
<td>Catch up vaccination</td>
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Immunization Coverage
HAV$_1$ Immunization Coverage Jerusalem District


All: 81 91 92 94 94 95 96 97 97 95 96
Arab: 78 82 87 91 88 89 91 89 87 86 87
Jews: 79 87 94 95 95 96 97 97 97 97 97
National Immunization Registry ISRAEL

Checkpoint
Pilot for 7 Branches
50 Users

BezeqInt
Public Internet

Firewall Cluster UTM 50

Terminal Server / Citrix
Active Directory
Conclusions I

- Epidemiologic shift from 5–9 y to 10–14 y.
- Unvaccinated adolescents - a high risk group.
- HA vaccine for post-exposure prophylaxis.
- Keep up - programme effectiveness is based no less upon vaccine efficacy as on high and sustainable vaccine coverage.
- Catch up - special attention to unvaccinated cohorts (Virus importations)
- Monitoring Immunization coverage is essential.

Conclusions II

- Within a few years of implementing universal hepatitis A vaccination in toddlers - near elimination of the disease in Israel was achieved.
- The HA experience in Jerusalem is the exception that proves the rule.

References:
# Acknowledgement

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<th>Jerusalem District (JD) Health Office</th>
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<td>Hanna Shoob</td>
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Jerusalem health office & Jerusalem municipality
Public health teams
Well baby clinics teams

Thank you for your attention!