EBV-Diagnostics
Serological Patterns for Detection and Exclusion of acute Infections

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EBV - General Informationen

Clinical picture
- Children: mostly no or mild and unspecific symptoms
- Adolescents: infectious mononucleosis in up to 30 – 60% of cases

Onset of disease
- Flu-like symptoms: discomfort, fatigue, limb pain, headache,...

Course of disease
- Fever, swollen lymph nodes, inflammations in the throat area
- Swollen lymph nodes (up to 50 %)
- Exanthema (up to 3%)
- Hepatitis (up to 3%)

流感症狀:不舒服、疲勞、四肢疼痛、頭痛
發燒、淋巴結腫脹、咽喉發炎
皮疹
EBV - Diagnostics

Most prominent field of application – Detection of infectious mononucleosis

- Detection of Pfeiffer glandular fever is most often performed by serology

Detection of antibodies against early phase and late phase markers enables discrimination between acute and past infections

- (V)CA: Capsid Antigen, expressed in lytic phase
  - Anti-CA IgM: early phase marker
  - Anti-CA IgG: intermediate early / late phase marker

- EBNA: EBV Nuclear Antigen, maintaining status of infection
  - EBNA-1: late phase marker

- EA: Early Antigen, initiation of virus replication (interaction with DNA polymer)
  - EA: marker of virus replication activity (reactivation)
EBV - Diagnostics

- Anti-VCA IgM marker for acute infections
- Anti-VCA IgG occur after several weeks/months and persist
- Anti-EBNA-1 IgG exclude an acute infection

Source: VioMecum - Das labormedizinische Nachschlagewerk
Avidity

- **Low avidity antibodies:**
  Low functional binding strength between antiserum and whole antigen
  (untrained immunity)
  - acute (primary) infection

- **High avidity antibodies:**
  High functional binding strength between antiserum and whole antigen
  (trained immunity)
  - past (previous) infection; reactivation
EBV – Avidity Determination

Avidity Determination is possible with ELISA and IIFT

Avidity in ELISA:

- 22 Sera of patients with **acute** EBV-infection
- 25 Sera of patients with **past** EBV-infection

\[
\text{RAI} (%) = \frac{\text{OD}_{\text{with urea}}}{\text{OD}_{\text{without urea}}} \times 100
\]

- **Not helpful for** < 0.150 OD
- RAI < 40% → low avidity
- RAI 40-60% → equivocal
- RAI > 60% → high avidity
Detection of EBV-related NPC

Detection of Nasopharyngeal carcinoma (NPC) is of high relevance in Asian regions.

NPC diagnostics can either be based on direct detection method (detection of EBV DNA in serum or plasma) or serology.

Serological diagnosis is mainly based on detection of anti-CA IgA (screening) and anti-EA IgA (confirmation) antibodies.

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<th>EUROWIMMUN</th>
<th>Anti-EBV-CA-IIFT (IgA)</th>
<th>Patients/controls</th>
<th>Sensitivity: 98%</th>
<th>Specificity: 85%</th>
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Thank you for your attention!