A review of histological parameters and CMV serology in Biliary atresia, and its relationship to long-term outcomes
Background

- Rare disease
- Incidence 1 in 5000 – 1 in 20 000 live births\(^1\)
- Progressive, obliterative cholangiopathy\(^2\)
  - affects intra-, and extra-hepatic bile ducts to varying degrees

Pathogenesis:
- Unknown
- Most likely multi-factorial
  - Genetic factors
  - Environmental toxins
  - Viruses
    - CMV, Reovirus, Rotavirus, Papilloma virus, EBV\(^2-6\)
Background

- Management:
  - KPE
  - Many will require liver Tx
    - Currently leading indication for liver Tx in children

- Prognosis
  - Factors implicated in affecting prognosis
    - Age of pt at KPE
    - Histological features
      - Degree of liver fibrosis
      - Size of bile ductules
      - Co-infection with CMV
Aims and Methods

- **Aims:**
  - Describe the patient demographic of patients presenting to CMJAH and CHBAH with Biliary atresia
  - Describe the long-term outcomes of these patients
  - To review Liver histology at the time of KPE, and its effect on outcome
  - To review the prevalence of CMV co-infection in our population at the time of KPE, and to investigate its effect on outcome.

- **Methods:**
  - Retrospective review of patients who presented with Biliary Atresia between 2009 and 2012
  - Patients selected from established database
  - Review of
    - patient demographics
    - Intra-operative histology
    - CMV serology
    - Outcomes
Results

43 patients

11 patients excluded due to inadequate or missing histology specimens or where long-term outcomes were unknown

Gender

- Male: 33%
- Female: 67%

Age at KPE

- Mean: 61 days (Range: 21 – 102 d)
Results

- Mortality: 45.8%
Results – Intra-operative histology

- Degree of fibrosis: According to METAVIR grading
Results – Intra-operative histology

- Bile duct hyperplasia
Results – Intra-operative histology

**Presence of Bile Plugs on Histology**
- Absent: 3%
- Present: 57%
- Bile lake formation: 3%
- Unknown: 37%

**Cholestasis Present**
- Mild: 33%
- Moderate: 20%
- Severe: 7%
- Unknown: 40%
Results

CMV serology

- Nr of patients: 13 CMV +
- Nr of patients: 9 CMV Exposed
- Nr of patients: 3 CMV -
Relationship between age at KPE and degree of fibrosis

- No correlation between age at KPE and degree of fibrosis
- Pearson’s r coefficient = 0.059
- p-value = 0.757
Relationship between degree of fibrosis and outcome

- Improved survival in patients with no/mild fibrosis at the time of KPE compared to patients with Gr3 fibrosis/cirrhosis.
- However, not statistically significant.
- P-value: 0.324

Key (According to METAVIR grade):
1 = No fibrosis/Mild Fibrosis (METAVIR Gr 0 /1 / 2)
2 = Severe bridging fibrosis/Cirrhosis (METAVIR GR 3 / 4)
Relationship between bile duct hyperplasia and outcome

- No statistically significant relationship between degree of bile duct hyperplasia and outcome
- P-value: 0.204

**Key:**
1 = No/Mild Bile duct hyperplasia
2 = Moderate/Severe bile duct hyperplasia
Results – Bile ductule size and outcome

- Bile ductule size at portal plate: <100 – 700 μm
- Mean: 0,359 μm
- No statistically significant correlation between bile duct size and outcome
- Pearson’s co-efficient = 0,048
- P-value: 0,887
Relationship between CMV serology and degree of fibrosis

- Pearson co-efficient = 0.124
- P-value: 0.513
Relationship between CMV serology and outcome

**Key:**
1 = CMV+
2 = CMV exposed, but negative

P-value: 0.518
In our study population, there was a high mortality rate after KPE.
Conclusion

- There was no clear correlation between Age of KPE and degree of fibrosis.
- Age, degree of fibrosis, degree of bile duct hyperplasia, Bile duct size did not show any statistically significant correlation with outcomes.
Conclusion

- CMV positive patients had a significantly earlier mortality compared to CMV exposed patients
  - No statistically significant effect on long-term outcomes.
References


Thank you to Dr De Maayer for the use of his Biliary Atresia database.
Thank you for your attention