Neuroblastoma 4s: Outcome from AIIMS NB 96 study

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NB- 4s: Introduction

- Incidence of stage NB 4s: 7-10%
- Most (96%) have favorable Shimada histology
  - < 10% have N-myc amplification
- One-third regress spontaneously
- Two-thirds require some treatment
NB- 4s: Introduction

• Indications for chemotherapy
  – severe respiratory distress
  – progressive disease
  – N-myc amplification
To review our Institution’s experience with 4s neuroblastoma, evaluating the presentation, management and outcome.
NB- 4s: Materials and Methods

• Prospective study
• Period: May 1996- July 2009
• Staging- INSS
• Chemotherapy for symptomatic patients
  – Cyclophosphamide + Doxorubicin
  – Cyclophosphamide + Vincristime (2006)
• Resection of residue after chemotherapy
NB-4s: Results

- Number of NB = 144
- Number of NB 4s = 12 (8.3%)
- Sex distribution

Girls: 2 (16.7%)
Boys: 10 (83.3%)
NB- 4s: Results (n = 12)
Age Distribution

> 1 month: 10 (83.3%)

< 1 month: 2 (16.7%)

Dead 1: Progressive disease

Dead 1: Progressive disease
NB-4s: Results
Presentation

NB 4s (n=12)

9 (75%): Resp. distress

3 (25%): Asymptomatic hepatomegaly
NB-4s: Results
Site of primary tumor

NB 4s (n=12)

- Adrenal = 8 (67%)
- Occult = 3 (25%)
- Extra-adr = 1 (8%)
NB-4s: Results
Site of metastatic tumor

NB 4s (n=12)
- Liver = 12 (100%)
- BM = 2 (16.7%)
- S/C nodules = 1 (8.3%)
NB-4s: Management (n=12)

Asymptomatic: 3

Symptomatic: 9

No chemo: 3
Post-op chemo: 1
Ventral hernia: 1
Prog. Disease: 2
Resect primary: 1
CR: 1
Chemo: 9
Resect primary: 4
No resection: 3
CR: 7
Death: 1
Disease free survival: 10
NB-4s: Management (n=12)

Asymptomatic: 3
- No chemo: 3
  - Resect primary: 1
    - CR: 1
  - Post-op chemo: 1
    - CR: 2

Symptomatic: 9
- Chemo: 9
  - Resect primary: 4
    - CR: 7
  - No resection: 3
- Death: 1

Disease free survival: 10

Presentation

Follow-up

Follow-up at 8 yrs
NB-4s: Management (n=12)

Asymptomatic: 3

Symptomatic: 9
NB-4s: Management (n=12)

Asymptomatic: 3

Symptomatic: 9

Chemo: 9

Death: 1

Disease free survival: 10
NB-4s: Management (n=12)

Asymptomatic: 3

Symptomatic: 9

Chemo: 9

4: CPM + Dox

5: CPM + VCR
NB-4s: Management (n=12)

Asymptomatic: 3
Symptomatic: 9
No chemo: 3
Post-op chemo: 1
Ventral hernia: 1
Prog. Disease: 2
Resect primary: 1
CR: 1
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Death: 1
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NB-4s: Management (n=12)

Symptomatic: 9

Chemo: 9

Resect primary: 4
No resection: 3

CR: 7

Prog. Disease: 2

Ventral hernia: 1

Death: 1

Death
NB-4s: Management (n=12)

Asymptomatic: 3
- No chemo: 3
  - Resect primary: 1
  - Post-op chemo: 1
    - CR: 1
    - Disease free survival: 10

Symptomatic: 9
- Chemo: 9
  - Resect primary: 4
  - No resection: 3
    - CR: 2
    - CR: 7
  - Prog. Disease: 2
    - CR: 7
    - Death: 1
    - Ventral hernia: 1
    - Death
NB-4s: Outcome (n=12)

Cumulative Survival

Kaplan-Meier survival estimates

- Stage 1 & 2: 100%
- Stage 4s: 83.3% [95CI; 48.2-95.6]
- Stage 3: 71.5% [95CI; 55.3-82.7]
- Stage 4: 35.7% [95CI 19.3-52.4]

P = 0.001

Survival Period
NB-4s: Discussion

• Treatment modalities:
  – observation with supportive care
  – low dose chemotherapy
  – radiotherapy
  – surgical creation of ventral hernia

• Role of surgical resection of primary tumor is debatable but most resect the primary tumor
Overall survival is 70-97%

Poor prognostic factors
  - age < 2 months
    - due to respiratory, renal, GI compromise and coagulative disturbances
  - Increased serum ferritin/ LDH/ NSE
  - poor Shimada histology, N-myc amplification and tumor diploidy
NB-4s: Conclusion

- NB 4s incidence in current study: 8.3%
- 75% were symptomatic (resp. distress)
- 75% had detectable primary tumor
- Spontaneous resolution: 16.7%
- Overall survival: 83.3%