2022 VIRTUAL CELEBRATE RESEARCH DAY

PRESENTATIONS

FELLOW ORAL COMPETITION CATEGORY
Developing screen time guidelines for children and youth with Autism Spectrum Disorder*: Using the Knowledge to Action Framework

Presented by Mor Cohen-Eilig, MD
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Fellow in Developmental Pediatrics
Sunny Hill center at BC Children’s Hospital
The University of British Columbia

* We alternate between identity - first language and Person - First Language (Autistic person and a person with autism) to allow representation of the different preferences within the autistic community (Vivanti, 2020).
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Division of Developmental Pediatrics
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Occupational Science & Occupational Therapy,
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Counseling and human Development
Faculty of Education
University of Haifa
No Disclosures
Why did we conduct this study?

- Children with autism can benefit from technology and screen time.
- Screen time management is an issue for families and clinicians working with children with ASD.
- There is currently limited knowledge on how to manage screen time for children with autism.
Study Design

A Panel of Experts

10 PARENTS

20 CLINICIANS

The Delphi Method

80 PERCENT AGREEMENT

4 POINT LIKERT SCALE

3 ROUNDS SURVEY

QUANTITATIVE & QUALITATIVE ANALYSIS
Screen Time Use Guidelines and Strategies
for Children & Youth with Autism

How can I support positive screen time use of children with autism?

Click the play icon above to view a video guide on navigating this website

The Pilot Website
How can I support positive screen time use of children with autism?

Click the play icon above to view a video guide on navigating this website.
How was screen time use defined?

In these guidelines and strategies, **screen time use** is defined as time spent with computers, television, tablets, video games, smartphones, and online social networking.

Leisure screen time use is defined as the time that is given to the child/youth to use screens for fun and entertainment according to their preference or choice.

These guidelines do not include the use of augmented and alternative communication (AAC) or any screen use for communication.
What aspects should be considered when using these guidelines and strategies?

Considerations for professionals

LEARN MORE
Considerations for professionals

How do I adapt screen time recommendations to the family needs?

How should clinicians provide support for families in managing screen time?
Screen Time Guidelines and Strategies

How should I manage my child’s screen time? Use timing?

How should I manage the content of children’s and youth’s screen time?

Red flags: What behaviours should I monitor?
How should I manage my child’s screen time use timing?

Try to encourage children to engage in their leisure screen time only after other important tasks such as schoolwork or chores.

Try to reduce or limit screen time (unless it is part of a behavioural support plan):
- While eating
- In child/youth’s bedroom
- Up to one hour before bedtime
- After bedtime
- As background noise (i.e., TV on when no one is actively watching).

Incorporate screen time with healthy, screen-free activities (i.e., physical activity) into the daily schedule.

Decide “how much” screen time is ideal, and speak about it with your children. When you decide the length of time, adapt it to the child’s age and development.

Try to keep the schedule consistent, with some flexibility when needed.
How should I manage my child’s screen time use timing?

Offer similar activities
When implementing changes, you could offer similar activities that are done in games on screen (e.g.: a social building block game like Jenga could be offered as well as an online building game).

Communicate and explain reasons of change
When you implement changes, speak with the children, explain the reasons and the planned changes, and how they will benefit from them. The conversation should be positive and encouraging.

Adopt the “Out of sight, out of mind” strategy
Caregivers could consider managing screen time use by removing screens or limiting access to screen media. When this is developmentally appropriate, some children might change activities with an “out of sight out of mind” strategy.

Involve all caregivers
Try to involve all caregivers to support screen time use (parent modeling is a good example of how to do this. For example, caregivers not bringing screens to the kitchen table at mealtime).

Teach with tools
Whenever possible, caregivers could teach children / youth with autism to manage their screen time (i.e., visual supports such as an hourglass timer can be used to develop a sense of duration and timing).

Do it gradually
If you decide to decrease screen time for autistic children / youth, do it gradually.

Seek professional support
If you decide to change screen time use, plan ahead, seek for professional support that can help you in the process.
How should I manage the content of children’s and youth’s screen time?

Try to encourage educational, active, or social screen time activities.

Whenever possible and feasible, you can use as an opportunity for children / youth to interact (for example, watching TV with all family members or playing video games with family members).

Make sure that the screen time contents are age appropriate.

When monitoring screen time content keep in mind the child’s interests and preferences.
How should I manage the content of children’s and youth’s screen time?

Know your child / youth’s screen time nutrition

For some children / youth, and if possible and feasible, using different designated devices for entertainment & learning (tool versus toy) is recommended.

Once “screen nutrition” is mapped, you can decide what usages could be reduced

Monitor the child / youth’s exposure to violent screen time content and whenever possible, caregivers should review content rating, i.e., ESRB ratings or video ratings.
Red flags: What behaviours should I monitor?

* Preoccupation with gaming (interfering with excepted daily function)

* Needing to spend long time gaming in order to satisfy the urge

* Inability to reduce playing / screen time use

* Giving up other activities, loss of interest in previously enjoyed activities due to gaming (i.e., unable to name 5 non-screen related activities that the child / youth currently participates in / enjoys)

* Continuing to game despite problems
Red flags: What behaviours should I monitor?

* Withdrawal symptoms when screen is taken away or not possible (sadness, anxiety, irritability, violence)

* Anger, sadness, or frustration while on screen

** Reduced physical activity and / or changes in weight due to screen time

** Sleep disturbances (problems falling asleep, reduced quality and duration of sleep) due to screen time problematic use

** Lower performance at school associated to screen time misuse leads to difficulties in concentration during the day
Key Links

These resources can provide additional information and guidance to parents and health providers.

- Length of Screen Time Use by Ages
- Online Safety and Controls: The Center for Online Circle
- Screen Time Controls
- Internet Gaming Disorder
Next Steps

- Survey for caregivers, clinicians and youth with autism
- Controlled intervention and outcomes
- Broad Dissemination among Clinicians and Parents

IF INTERESTED, PLEASE GO TO: https://tinyurl.com/ASDScreenTimeGuidelines
Preliminary feedback from the survey

“I liked the general respect of family choice and respect for those impacted (e.g. recommendation to make slow changes).” (A clinician)

“It's a lovely website, will be helpful for families.”
(A clinician)

“I like the non-judgmental language.” (A parent)
Acknowledgments

Emma Lei, Janice Chan, Kimberly Nguyen, Natasha Kuzyk - MOT students, Occupational Science & Occupational Therapy, Faculty of Medicine, The University of British Columbia

Graphic and website design: Ryan Octosa, Occupational Science & Occupational Therapy, Faculty of Medicine, The University of British Columbia
CELEBRATE RESEARCH DAY

- Paul D’Alessandro, MD, MSc, FRCPC
- Pediatric Hematology Oncology Fellow
- BC Children’s Hospital
- University of British Columbia
- April 8, 2022
- Supervisor: Dr Rebecca Deyell
Children and adolescents diagnosed with cancer in Canada 5-year OS >84%
  • Survival lower in relapsed, refractory, progressive disease (RRPD)
  • Patients with RRPD may benefit from Phase I/II clinical trial
Enrolment on clinical trials at upfront diagnosis in Canada is 27.5%
  • Decreased progressively every 100 km from tertiary center
Vast geography, centralized resources, limited access
  • 30% of population outside area with cancer center
  • Phase I/II trials excluded from interprovincial agreements
Distance as a factor for enrolment on Phase I/II trials at RRPD remains unexplored
RESEARCH AIMS & HYPOTHESIS

• Primary Aims:
  • Describe availability of early phase trials to pediatric patients in British Columbia with RRPD
  • Determine if distance from home to BC Children’s Hospital (BCCH) predicts odds of local phase I/II trial enrollment among eligible patients on univariate analysis

• Secondary Aims:
  • Multivariable analyses for impact of distance adjusted for other clinical variables
  • Survival outcomes (EFS and OS) for patients with eligible RRPD events
  • Describe patients treated at outside centres (outside BC, outside Canada)

• Hypothesis: BC pediatric patients with RRPD & eligible for phase I/II trial in BC were less likely to enrol if home address was further from our center
METHODS

- Retrospective cohort study
- REB approval
- January 1, 2015 – July 30, 2021
  - Relapse Registry Database
  - Phase I/II Clinical Trial Screening Logs
- Distance calculated using postal code, analyzed as categorical variable
  - Geocoding Software: CDXZipStream v5.1.0.3, CDX Technologies, Randolph, NJ
  - Within Lower Mainland & ≤100 km vs Outside Lower Mainland or > 100 km
- Additional Clinical Variables:
  - Age; Cancer Diagnosis; Ethnicity; SES; Time to First Eligible RRPD Event; Prior Therapy; Disease Timepoint (First RRPD versus Second/Beyond); Date/Clinical Status at Most Recent Follow-Up, Transition, or Death; TB/BMT Discussion
- SES identified using Postal CodeOM Conversion File Plus Software v7D (Statistics Canada, Ottawa, ON)
  - Geocoding Software Linking Postal Code to 2016 Census Data
Patients with RRPD events (n=266)

- Patients eligible for a local phase I/II trial at least once (n=75)
  - Patients offered enrolment on local phase I/II trial (n=61)
    - Patient agreed to enrol on local phase I/II study (n=30)
    - Patient declined to enrol on local phase I/II study (n=31)
  - Patients not offered local phase I/II trial per MD choice (n=14)
- Patients never eligible for a local phase I/II trial (n=191)
<table>
<thead>
<tr>
<th></th>
<th>Patient Cohort (n=61) (Range/Proportion)</th>
<th>Enrolled on Trial (n=30)</th>
<th>Not Enrolled on Trial (n=31)</th>
<th>T test/ Chi Square (p value)</th>
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<td>Median age at Diagnosis (y)</td>
<td>6.9 (0.8-18.1)</td>
<td>7 (0.8-18.1)</td>
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<td>• Outside lower mainland</td>
<td>21 (34.4)</td>
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<td>Socioeconomic Quintile</td>
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<td>Patient Cohort (n=61) (Proportion/Range)</td>
<td>Enrolled on Trial (n=30) (Proportion/Range)</td>
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<td>T test/Chi Square (p value)</td>
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<td>-----------------------------------</td>
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<td><strong>Median Time to First Eligible RRPD Event (y)</strong></td>
<td>2.67 (0.42-15)</td>
<td>3.39 (0.42-9.9)</td>
<td>3.25 (0.58-15)</td>
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<td><strong>Disease Status</strong></td>
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<td>• First RRPD</td>
<td>37 (60.7)</td>
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<td>• Second RRPD/Beyond</td>
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<td><strong>Prior Therapy</strong></td>
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<td>• ≥ 2 Lines of Prior Therapy</td>
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<td>21 (70.0)</td>
<td>16 (51.6)</td>
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<td><strong>Prior Enrolment on Any Trial</strong></td>
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<td>6 (20.0)</td>
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<td>• Enrolled</td>
<td>52 (85.2)</td>
<td>24 (80.0)</td>
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<td>• Never Enrolled</td>
<td>52 (85.2)</td>
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<td><strong>Prior Enrolment on Phase I/II Trial</strong></td>
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<tr>
<td>• Enrolled</td>
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<td>• Never Enrolled</td>
<td>53 (86.9)</td>
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<td><strong>TB/BMT Rounds Discussion</strong></td>
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<td>• Discussed</td>
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<td>15 (50.0)</td>
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<td>15 (50.0)</td>
<td>18 (58.1)</td>
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</table>
RESULTS

• 14 patients not offered Phase I/II trial at first eligible RRPD event per physician preference
  • 92.9% (n=13) offered other treatment
    • Curative or Palliative Intent
  • 35.7% (n=4) cited complex social situations
RESULTS

• 15 patients treated on Phase I/II trials at outside centres
  • 11 patients never eligible local trial
  • 4 patients eligible for local trial at least once
• 47% (n=7) treated on trials that we eventually opened locally
  • 40% (n=6) received CarT cell therapy for leukemia
2 year EFS: 39.8% ± 13.3%  
2 year OS: 52.6% ± 13.6%

Survival proportions: Survival of EFS

Survival proportions: Survival of OS

Probability of Survival

Time RRPD to Next Event or Last FU

p=0.729

Time RRPD to Death or Last FU

p=0.148
Survival proportions: Survival of EFS

Survival proportions: Survival of OS

p=0.0002

p<0.0001
CONCLUSIONS

- Overall enrolment on Phase I/II trial at first eligible RRPD event was low
  - 28.2% eligible at least once, 22.9% offered, 11.3% enrolled
- Distance from home to BCCH was not associated with local trial enrolment status in eligible patients (p=0.86)
- Males more likely to enroll (p=0.016)
- Half of patients treated outside province were on trials eventually opened at our center (CarT cells)
- 2 year EFS 39.8% ± 13.3%, 2 year OS 52.6% ± 13.6%
  - Enrolment Status (p=0.729, p=0.149)
  - Disease Category (Solid Tumour NOS, Sarcoma, High Grade CNS Tumours) (p=0.0002, p<0.0001)
- Phase I/II trial enrolment could be increased by offering/opening more trials at tertiary pediatric cancer centres
REFERENCES

• Ellison LF, Xie L, Sung L. Trends in paediatric cancer survival in Canada, 1992 to 2017. Statistics Canada, Catalogue no. 82-003-x. Health Reports. February 2021. 32(2)


Background

- In Canada, 31-39% of pediatric bacteremia is caused by Gram-negative organisms, most commonly *Escherichia coli*, *Klebsiella* and *Enterobacter* spp.

- Gram-negative pathogens cause 36% of neonatal meningitis, 80-90% of all pediatric urinary tract infections (UTIs), and intra-abdominal sepsis and healthcare-associated infections.


Traditional risk factors for pediatric antibiotic resistant infections include

- previous ESBL infection
- carriage or exposure
- recent/prolonged hospitalization
- travel to a “high ESBL-prevalence” area
- broad-spectrum antibiotic exposure

Antibiotic-resistant bacteria, however, are increasingly identified in children without known risk factors


Study Participants
Children attending BCCH aged ≤18 years who have a Gram-negative bacteremia

Inclusion Criteria
A child will be included if all apply:
• Patient attending BC Children’s Hospital from 1 September 2019 - 31 December 2021
• Bacterial isolate collected from blood
• ‘Antibiotic-resistant’ as defined in laboratory manual.
• Positive culture of susceptible- Gram-negative bacteria

Exclusion Criteria
More than one organism in blood

Laboratory Manual

‘Antibiotic-resistant’ (if it satisfies at least one of):
• Ceftriaxone-resistant Enterobacteriaceae
• Carbapenem-resistant Enterobacteriaceae
• Enterobacteriaceae resistant to at least 2 of fluoroquinolones, aminoglycosides or trimethoprim
• Non-Enterobacteriaceae resistant to at least 3 of fluoroquinolones, aminoglycosides, carbapenem, ceftazidime or piperacillin-tazobactam

If none of the above, then ‘non-antibiotic resistant’.
Gram-negative bacteremia over study period: total 94

- Sept 19-Mar 20: 28
- March 20-Sept 20: 28
- Sept 20- March 21: 26
- Mar21-Sept 21: 14
- Sept 21-Mar 22: 21
Clinical cases: 94

- Escherichia coli: 38%
- Klebsiella pneumoniae: 12%
- Pseudomonas aeruginosa: 11%
- Salmonella typhi: 6%
- Salmonella enteritidis: 6%
- Escherichia coli: 5%
- Enterobacter cloace complex: 6%
- Klebsiella pneumoniae: 12%
- Salmonella enteritidis: 6%
- Pseudomonas aeruginosa: 11%
- Klebsiella oxytoca: 5%
- Serratia marcescens: 5%
- Burkholderia multivorans: 5%
- Morganella morganii: 5%
- Prevotella: 5%
- Salmonella typhi: 5%
### Demographics and Manifestations

#### Table 1: Patient Characteristics

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<th>Parameter</th>
<th>Number (%)</th>
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<td>Gender</td>
<td>94</td>
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<tr>
<td>Male</td>
<td>62 (66.0%)</td>
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<tr>
<td>Female</td>
<td>32 (34.0%)</td>
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<tr>
<td>Age</td>
<td></td>
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<tr>
<td>≤28 days</td>
<td>23 (24.5%)</td>
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<tr>
<td>1-12 months</td>
<td>23 (24.5%)</td>
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<tr>
<td>1-5 years</td>
<td>18 (19.1%)</td>
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<tr>
<td>&gt;5 years</td>
<td>30 (31.9%)</td>
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<td>Ethnicity</td>
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<td>White</td>
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<td>East Asian</td>
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<td>South Asian</td>
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<tr>
<td>Indigenous</td>
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<td>Latino/Latina (Hispanic)</td>
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<td>Southeast Asian</td>
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<td>Middle Eastern</td>
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<td>Black</td>
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<td>Unknown</td>
<td>38 (39.2%)</td>
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<td>PICU</td>
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<td>Inpatient Surgery</td>
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#### Manifestations

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<thead>
<tr>
<th>Manifestations</th>
<th>N=94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteremia</td>
<td>94 (100%)</td>
</tr>
<tr>
<td>UTI</td>
<td>21 (22%)</td>
</tr>
<tr>
<td>Febrile Neutropenia</td>
<td>18 (19%)</td>
</tr>
<tr>
<td>Enteritis/Colitis</td>
<td>14 (15%)</td>
</tr>
<tr>
<td>Meningitis</td>
<td>5 (5.3%)</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td>Osteomyelitis</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

70/94 (75%) had an underlying chronic medical condition

25% without a known diagnosis: UTI and enteritis/colitis were the commonest source.
Antibiotic resistant Gram-negative bacteremia

- 23/94 (25%) MDR
- 19/23 had underlying chronic medical conditions
- 18/23 (78%) Broad spectrum antibiotic exposure in the 30 days before the episode of Gram-negative bacteremia
- 2 patients did not have apparent risk factor for MDR infection

Commonest Medical condition:

- Haematology/Oncology 12/23 (52%)
- Prematurity: 4/23 (17%)
- Recurrent UTI: 3/23 (13%)
- Complex congenital anomalies requiring surgery: 2/23 (9%)
- Solid organ transplant: 1/23 (4.5%)
- Gastroenteritis with recent foreign travel: 1/23 (4.5%)
Factors associated with Gram-negative bacteremia

› Central lines: 46/94 (48%) 32 (34%) required a change

› Recent surgery: 15/94 (16%) Require surgery due to infection Yes: 8 (9%)

› Recent viral infection: 11/94 (12%)

› International Travel: Yes: 3 (3%)
Clinical Outcomes

Recurrent Gram-negative infection

› 7 patients had 2 episodes of Gram-negative infection over the study period
› UTI: 3 recurrence with the same organism as initial bacteremia.
› *E. Coli* non MDR, *Serratia marcescens* MDR, *Klebsiella pneumonia* non MDR
› Bacteremia: 4
› 1/4 same organism as original episode
› 4/4 second episode bacteremia with multidrug resistant organism
› 3/4 first episode bacteremia were classified as Fatality

Fatality

› Overall case fatality in this cohort was 8 (8.5%).
› MDR Gram negative bacteremia: 4/23 (17%) all cause mortality
› Non MDR: 4/71 (5.6%) all cause mortality.
› 5 Patients died after first episode of Gram-negative bacteremia
› 3 patients died after second Gram negative infection.
› 3 Deaths due to underlying disease
› 5 Deaths directly attributable to the Gram-negative bacteremia
Conclusion

- Gram-negative bacteremia cause significant burden of disease
- High risk populations: neonates and immune suppressed haematology/oncology
- Multidrug resistant Gram-negative infections associated with recent broad spectrum antibiotic exposure, and has associated higher mortality rate.
- International travel not a feature in this cohort
- Recurrent Gram-negative bacteremia poor prognosis: due to mainly due to underlying medical condition
References

- Alice X Lu, Kara Tsang, PhD(c), Michelle Barton, MD, Craig Frankel, MD, Jane McDonald, MD, Jennifer Bowes, MSc, John Gunawan, MD, Sergio Fanella, MD, FRCP(C), DTM&H, Mohammad Alghounaim, MD, Jeannette Coumeau, MD, Kirk Leifso, MD, Robert Slinger, MD, Joan Robinson, MD, Sarah Khan, MD, MSc, FRCP(C). Paediatric Collaborative Network on Infections in Canada (PICNIC) Study of the Current Landscape of Gram Negative Bacteremias, *Open Forum Infectious Diseases*, Volume 7, Issue Supplement_1, October 2020, Page S148, [https://doi.org/10.1093/ofid/ofaa439.342](https://doi.org/10.1093/ofid/ofaa439.342)


Glomerular filtration rate trajectories in children with type 1 diabetes

Celebrate Research Day

**Presenter:** Kristen Favel

**Supervisors:** Cherry Mammen, Constadina Panagiotopoulos
Background

Diabetic kidney disease is a major cause of chronic kidney disease (CKD) worldwide in adults.

Literature on the trajectory of renal function in T1D from childhood through young adulthood is sparse.

(1) Feener EP. Lancet (1997)
(3) Couser WG, Remuzzi G, Mendis S, Tonelli M. Kidney Int (2011)
Background

Figure 1. Development of glomerular filtration rate (GFR) with age. Presentation of 5th and 95th percentile of GFR measured by inulin clearance in healthy children. Data derived from Brodehl et al.

Background

Figure 1. Unadjusted linear model of eGFR as a function of duration of T1D (dotted lines represent thresholds of 90 ml/min/1.73 m² and 140 ml/min/1.73 m²)

(5) Favel K et al. Can J Diab (2022)
Hypothesis

We hypothesize that children demonstrate a decline in eGFR within a relatively short period of follow-up from diagnosis of T1D
Study objectives

In a cohort of children with T1D, we sought to

1. Describe the prevalence of CKD
2. Describe individual eGFR trajectories
3. Describe clinical factors associated with decline in eGFR
Study design

Ambispective cohort study (2016-2021)

Included children diagnosed with T1D under 18 years of age followed in the BCCH diabetes clinic

Data collected from BC Children’s Hospital medical records

Baseline: Sex, age at diagnosis, insulin modality, history of DKA

Follow-up: Body mass index, blood pressure, A1C, urine albumin-creatinine ratio, serum creatinine
Estimation of GFR

eGFR was calculated in children using the Schwartz formula

\[
eGFR (\text{ml/min/1.73 m}^2) = 36.5 \times \text{height / serum creatinine}
\]

CKD was staged based on the National Kidney Foundation K/DOQI Guidelines for CKD

\[
CKD = eGFR < 60 \text{ ml/min/1.73 m}^2
\]

At risk for CKD = eGFR 60-<90 \text{ ml/min/1.73 m}^2
## Categories of eGFR trajectories

<table>
<thead>
<tr>
<th>Category</th>
<th>Annualized change in eGFR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stable</strong>: Overall eGFR trajectory is stable</td>
<td>Between (-1) to (+1) ml/min/1.73 m(^2)/year</td>
</tr>
<tr>
<td><strong>Increasing</strong>: Overall eGFR trajectory is positive</td>
<td>Greater than (+1) ml/min/1.73 m(^2)/year</td>
</tr>
<tr>
<td><strong>Decreasing</strong>: Overall eGFR trajectory is negative</td>
<td>Less than (-1) ml/min/1.73 m(^2)/year</td>
</tr>
</tbody>
</table>
Data analysis

Descriptive data presented as proportions, medians, and interquartile ranges

Paired comparisons between groups of continuous variables: Wilcoxon-Signed Rank Test

Comparisons between groups of categorical variables: Fisher-Exact Test

Comparisons between groups of continuous variables: Kruskal-Wallis Test
## Baseline characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total (N=104)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>44 (42%)</td>
</tr>
<tr>
<td>Age at diagnosis (years)</td>
<td>5.7 (3.4, 9.3)</td>
</tr>
<tr>
<td>Duration of T1D (years)</td>
<td>4.3 (1.2, 7.2)</td>
</tr>
<tr>
<td>History of diabetic ketoacidosis</td>
<td>48 (46%)</td>
</tr>
<tr>
<td>History of acute kidney injury</td>
<td>23 (22%)</td>
</tr>
<tr>
<td>Insulin pump</td>
<td>49 (47%)</td>
</tr>
<tr>
<td>Body mass index</td>
<td></td>
</tr>
<tr>
<td>&lt; 85th percentile</td>
<td>61 (59%)</td>
</tr>
<tr>
<td>≥ 85th percentile</td>
<td>43 (41%)</td>
</tr>
<tr>
<td>Hemoglobin A1c</td>
<td></td>
</tr>
<tr>
<td>&lt; 7%</td>
<td>11 (11%)</td>
</tr>
<tr>
<td>7-%&lt;9%</td>
<td>69 (66%)</td>
</tr>
<tr>
<td>≥ 9%</td>
<td>24 (23%)</td>
</tr>
</tbody>
</table>

Median (Q1, Q3) reported for quantitative variables and absolute (%) for qualitative variables
# Prevalence of CKD

## Renal parameters (N=104)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Renal function</strong></td>
<td>26% of participants had eGFR &lt;90</td>
</tr>
</tbody>
</table>
| **Urine albumin-creatinine ratio (ACR)** | 61% of participants were eligible to start ACR screening  
3% of participants had repeated abnormal ACRs |
| **Blood pressure**               |         |
| SBP ≥ 95th:                       | 18%     |
| SBP > 130:                        | 7%      |
| DBP ≥ 95th:                       | 6%      |
| DBP > 85:                         | 3%      |
Overall eGFR trajectories

Median eGFR: 117 (107, 132) ml/min/1.73 m²

Median annualized change in eGFR:
-2.5 (-7.7, 2.7) ml/min/1.73 m²
Categories of eGFR trajectories

- Stable (N=18)
- Increasing (N=28)
- Decreasing (N=58)
Clinical factors associated with decreasing eGFR trajectory

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Decreasing (N=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
</tr>
<tr>
<td>Duration of T1D</td>
<td>4.8 (1.7, 7.7)</td>
</tr>
<tr>
<td>Body mass index percentile</td>
<td>78 (49, 92)</td>
</tr>
<tr>
<td>Systolic BP percentile</td>
<td>62 (39, 75)</td>
</tr>
<tr>
<td>Diastolic BP percentile</td>
<td>40 (29, 55)</td>
</tr>
<tr>
<td>Hemoglobin A1C</td>
<td>7.8 (7.4, 9.0)</td>
</tr>
</tbody>
</table>

Median (Q1, Q3) reported for quantitative variables and absolute (%) for qualitative variables

*p <0.05 for Wilcoxon-Signed Rank Test
Summary

1. 26% of children in our cohort are at risk for CKD
2. eGFR trajectories are heterogenous, with over half of patients having a decreasing trajectory
3. Decreasing eGFR trajectories are influenced by multiple, modifiable factors
Clinical Implications

These findings are concerning given the increased risk of CKD and end-stage renal disease in adults with T1D.

These data suggest that careful monitoring of serum creatinine and blood pressure at baseline and regular intervals is warranted in children with T1D.
Acknowledgements

UBC Clinician Investigator Program
Dr. Panagiotopoulos
Dr. Mammen
References

The Social Determinants of Health

COVID Check-In: Optimizing Cleft & Craniofacial Team Care during COVID-19 using an on-line social pediatrics screening instrument

Research Day: April 8, 2022

Emily Fisher

Co-authors: Sandra Robertson RN CC, Doug Courtemanche MD Plastic surgery, Will Lau MD, Lisa S MD Student, Ethan Ponton BSc, Christine Loock MD, FRCPC
Disclosures

Ethics approval: approved by PHSA research privacy officer, ethics board exempt due to QI Article 2.5 of TCPS2.

Our research team has no disclosures.
We would like to acknowledge that we work, live and play on the traditional, ancestral and unceded territory of the Coast Salish peoples – Skwxwú7mesh (Squamish), Stó:lō and Sélílwətaʔ/Selilwitulh (Tsleil-Waututh) and x�wməθkwəy̓əm (Musqueam) Nations.
BC Children’s Hospital Cleft Palate Program

**Interdisciplinary Team Care**
- audiology
- clinic administration
- orthodontics
- otorhinolaryngology
- pediatrics
- plastic surgery
- oral-maxillofacial surgery
- social work
- speech language pathology
- **pediatric nurse practitioners**

**Consulting**
- neurosurgery
- ophthalmology
- psychology
- medical genetics
- developmental pediatrics

**Community**
- dentists
- orthodontists
- ENT
Cleft Craniofacial Program BC Children’s Hospital

>2400 active patients
In BC ~ 1 million children and youth
Estimated incidence in BC ~1/700 (Julian little – congenital anomalies – Health Canada)

Fisher & Loock et al. 2022
Social determinants of health: *non-medical factors that influence health*

(World Health Organization, 2021)

Access to care and burden of care have greatest implications in patients and families in cleft and craniofacial care due to the multidisciplinary care required over the patient’s lifetime.

(Nelson et al., 2011)
• Investigated the SDoH for patients attending the British Columbia Children’s Hospital Cleft Palate-Craniofacial program

• To determine if we could effectively discuss SDoH with patients and families in a trusted and responsive environment
Barriers to care
Economic factors
Adversity/ACEs
Resiliency
Social capital

https://www.bcchr.ca/opsei/surgery-and-society

Fisher & Loock et al. 2022
Incidence of Orofacial Clefts in BC First Nations ~ 2x greater
\[ \frac{3.74}{1,000} \] vs BC total rate \[ \frac{1.97}{1,000} \] live births
(Lowry and Renwick, 1967)

15/33 (45%) of families living below poverty line (<$40,000) self-identify as Indigenous

45% Families reporting <$40,000 household income

Mean ACE score vs Income

Mean ACE score of the lowest income group is statistically significantly higher than the highest two income groups

Percent of Families who Identify as Indigenous

18% Identify as Indigenous
82% Do not identify as Indigenous

Percent of Families who Identify as Indigenous

Families reporting <$40,000 household income

0 0.5 1 1.5 2 2.5
Mean ACE Score

Indigenous
Non-Indigenous

15/33 (45%) of families living below poverty line (<$40,000) self-identify as Indigenous
Rationale

• We anticipated that the pandemic would intensify adverse SDoH.

• We pivoted to an on-line “What matters to you?” Questionnaire, hosted on REDCap, including a 5-point abbreviated BEARS “COVID Check-in”.

“What is most important to you at this moment?”

Fisher & Loock et al. 2022
Rationale

• To identify the “indirect” effects of the COVID-19 pandemic on our cleft and craniofacial population

Hypotheses:

• Social support and resiliency may be protective factors for mental health during the pandemic (Li et al., 2021).

• Perceived social support declined due to forced isolation.

• Asking patients and families about social support and resiliency are even more important during situations in which individuals or families may be more socially isolated.

• Resiliency is not a DIY – it relies on responsive inter-sectoral systems (Ungar, 2019).
Goals + Objectives

• To utilize our “COVID-BEARS” questionnaire to determine how the pandemic affected SDoH in our cleft & craniofacial population

• To explore the on-line pre-clinic questionnaire using “WMTY?” approach
Methods

• Our team incorporated a 5-question online pre-clinic smartphone-accessible SDoH survey as part of a longer 40 point review of systems questionnaire from 8 disciplines

• We distributed this to families prior to their multidisciplinary team clinic visit during the COVID-19 pandemic

• We analyzed survey results from 17 months (May 2020-October 2021)
Methods

What paediatricians can do to support children and youth during the COVID-19 pandemic

Posted: May 5, 2020

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Principal author(s)
Shazeen Suleman, Yasmine Ratnani, Christine Loock, Katrina Stockley, Susan Bennett, Radha Jetty, Katharine Smart, Sarah Gander, Social Paediatrics Section

Fisher & Loock et al. 2022
Results

COVID Check-in

- Change in employment: 32%
- Reduction in income: 20%
- Difficulty accessing healthcare: 20%
- Less than 5 support people: 74% (Increase from 47% pre covid)
- Concern about child’s:
  - school: 38%, mental health: 36%, social wellbeing: 31%
- What matters?
  - Understanding my condition and concerns
  - Having a team, having a plan

Fisher & Loock et al. 2022
Implications

• Our study revealed that 5 key SDoH screening questions can be used to:

• Pre-emptively facilitate care coordination, responsiveness, and triage for in-person clinics and virtual care settings.

• Respond to family centred care priorities in the midst of evolving COVID-19 and similar landscapes.
Implications

The Future

• New Funding
  • + 2 Speech language pathologist (one replacement, one new)
  • + 1 Nursing/coordinator support
  • +0.6 Social Work
  • $483,000 added to our base funding

• We have a business plan and a draft Program re-design
  • VPI Clinic, Transition Clinic
Future direction

To explore the utility of our questionnaire in both virtual and in-person clinics for:

- Experience of families
- Effectiveness of team care
- Efficiency during and after COVID
- Experience of providers

Photographs with permission by Kent Danielson, 2022
Future direction – 7 Positive Childhood Experiences

Before age 18:

1. Able to talk with my family about my feelings.
2. Felt that my family stood by me during difficult times.
3. Enjoyed participating in community traditions.
4. Felt a sense of belonging in high school.
5. Felt supported by friends.
6. Had at least two non-parent adults who took a genuine interest in me.
7. Felt safe and protected by an adult in my home.

https://jamanetwork.com/journals/jamapediatrics/fullarticle/2749336
Acknowledgements
Comparison of clinical outcome between parents versus siblings as donors in haploidentical hematopoietic stem cell transplants in pediatric patients, a 10-year experience at a single institution

Dr. Huan Ng
Clinical Fellow
Division of Pediatric Hematology/Oncology/BMT
Oral presentation
Celebrate Pediatric Research Day, UBC Department of Pediatrics
8th April 2022
Background

• **Haploidentical stem cell transplantation (SCT)** has been increasingly performed in the past decade for both malignant and non-malignant conditions in pediatric patients.

• **Selection of donors are often readily available** in haploidentical SCT making the process of donor search and work up much more straightforward and efficient particularly for patients who are in need of SCT imminently.

• This in conjunction with marked **improvement in immunosuppressive approach for graft versus host disease (GVHD) prophylaxis** to overcome the haplotype mismatches has yielded comparable outcomes in haploidentical SCT when compared with matched related or unrelated donor SCT.

• The process of selecting a single best donor often becomes a controversial subject of discussion when the available pool of donors with similar haplotype increases.
What do we know so far?
The biological difference

• Jaiswal et al’s whole-exome sequencing data from DNA in the peripheral blood cells of 22 population based cohorts discovered increasing frequency of somatic mutations with age and hence can increase the risk of clonal hematopoiesis as well as mortality.

• Although not fully known, but the differing biological properties of stem cells from different donors are pivotal in recipients’ transplant outcomes. Ciurea et al supported this finding as younger donors might have lower likelihood of clonal hematopoiesis compare with older donors and better TNC and CD34 cell yield.
Evidence in the literature

- Increasing donor age (>40 years) has been associated with inferior post-transplant outcome with higher non-relapse mortality (NRM) and overall survival (OS) in adult patients. Donor kinship is also thought to be prognostically significant when patients were transplanted from children donors over the age of 35 had lower NRM and OS. However, these characteristics were not as impactful when the recipients were younger than 40 years.

- Wang et al and Xu et al reported in a study using the Beijing protocol that the order of preferred donor among relatives is children, male sibling, female sibling, father, mother, and a second degree half HLA-matched relative. This recommendation is based on the finding of lower incidence of acute GVHD, NRM and better survival associated with younger donor (age<30 years) in unmanipulated haploSCT. Kollman et al, Gonzalez-Vicent et al, Ciurea et al reported similar beneficial outcome in using donors of younger age.

- Gonzalez-Vicent et al also reported faster immune reconstitution when younger donors are used in T-cell depleted (TCD) haploSCT of pediatric patients. In this study, the use of older donors are also associated with augmented infections, acute GVHD, more NRM and worse disease free survival (DFS).

- Solomon et al reported higher risk of relapse and worse survival in recipients receiving stem cell graft from a parent donor when compared with a child donor. The impact is more so due to donor-recipient relationship and recipient age but not donor age were independently associated with survival.
Hypothesis

• Due to the intrinsic biological difference in our hematopoietic stem cells, we hypothesize that donors of varying ages, donor/recipient kinship have differing impact on the transplant outcomes of pediatric patients.
Objectives

• Primary objectives:
  • To compare the time to engraftment (neutrophils and platelets) between parent donor group and sibling donor group

• Secondary objectives:
  • To compare the rate of graft failure between parent donor group and sibling donor group
  • To compare the rate of aGVHD, cGVHD, event free survival (EFS) and overall survival (OS) between parent donor group and sibling donor group
Methods

• We conducted a retrospective analysis of all haploidentical SCT performed at British Columbia Children’s Hospital (BCCH) between 2012 and 2021.

• The study was reviewed and approved by the Research Ethics Board (REB) of the University of British Columbia.

• Per study protocol, all patients who underwent a T-cell replete (unmanipulated) haploidentical SCT since 2012 were identified and included in the analysis.

• The patients were divided into 2 groups, parents as donors (G1) versus siblings as donors (G2), with 2 to 5 antigen or allelic mismatches at HLA-A, -B, -C, -DRB1, and -DQB1, for statistical analysis.

• Baseline characteristics were collected from our institutional database.

• Clinical outcome included in analysis are time to neutrophil engraftment(days), time to platelet engraftment(days), rate of acute and chronic GVHD (graded as per National Institute of Health consensus criteria), non-relapse mortality (NRM), event free survival (EFS) and overall survival(OS).
Data analysis

• For continuous data (Time to neutrophil/platelet engraftment)
  • Kruskal Wallis Test (non parametric equivalent of Wilcoxon-rank sum test)

• For categorical data (Acute GvHD/Chronic GvHD)
  • Fischer’s Exact Test

• For survival curves (EFS/OS)
  • Kaplan-Meier estimation
  • Log-rank test to compare between 2 survival curves

Dr. James E. Potts
Results

• A total of 43 haploidentical SCT were performed between 2012 and 2021
• **39 T-replete (unmanipulated) haplo SCT** and 4 T-depleted haplo SCT.
• Only the T-replete haplo SCT were included in the analysis.
• 19 patients received SCT from their parents (G1) and 20 patients from their siblings (G2).
• Median age of donors are 37 years (22-54 years) in G1 Vs 11 years (2-19 years) in G2.
• Median length of follow up is 22.7 months (1.6-71.2 months) in G1 Vs 11.6 months (0.4-104 months) in G2.
### Indications for transplant

<table>
<thead>
<tr>
<th>Underlying condition</th>
<th>Parents as donors (n=19)</th>
<th>Siblings donors (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Malignant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lymphoid (HR/relapsed ALL)</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>- Myeloid (AML/MDS)</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>- Anaplastic large cell lymphoma</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>- Mixed phenotypic acute leukemia</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Non-malignant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Osteopetrosis</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>- Aplastic Anemia</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>- Chronic granulomatous disease</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- Erythropoietic protoporphyria</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>- Krabbe disease</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>
## Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>Parents as donors</th>
<th>Siblings as donors</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number, n</td>
<td>19 (48.7%)</td>
<td>20 (51.3%)</td>
<td>-</td>
</tr>
<tr>
<td>Age of recipients (median; years)</td>
<td>8.1 (0.7-16.6)</td>
<td>9.2 (1.6-19.9)</td>
<td>0.161</td>
</tr>
<tr>
<td>Age of donors (median; years)</td>
<td>39.0 (22.0 – 54.0)</td>
<td>11.0 (2.0-19.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex (recipients)</td>
<td></td>
<td></td>
<td>0.732</td>
</tr>
<tr>
<td>- Male</td>
<td>11 (58%)</td>
<td>10 (50%)</td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>8 (42%)</td>
<td>10 (50%)</td>
<td></td>
</tr>
<tr>
<td>Sex (donors)</td>
<td></td>
<td></td>
<td>0.516</td>
</tr>
<tr>
<td>- Male</td>
<td>8 (42%)</td>
<td>11 (55%)</td>
<td></td>
</tr>
<tr>
<td>- Female</td>
<td>11 (58%)</td>
<td>9 (45%)</td>
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<tr>
<td>Underlying diagnosis</td>
<td></td>
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<tr>
<td>- Malignant</td>
<td>14 (74%)</td>
<td>16 (80%)</td>
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<tr>
<td>- Non-malignant</td>
<td>5 (26%)</td>
<td>4 (20%)</td>
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</tr>
<tr>
<td>Conditioning regimen</td>
<td></td>
<td></td>
<td>0.880</td>
</tr>
<tr>
<td>- TBI based</td>
<td>7 (37%)</td>
<td>6 (30%)</td>
<td></td>
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<tr>
<td>- Non-TBI based</td>
<td>12 (63%)</td>
<td>14 (70%)</td>
<td></td>
</tr>
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### Stem cells source

<table>
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<tr>
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<th>Siblings as donors</th>
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<tr>
<td>BM</td>
<td>15 (79%)</td>
<td>17 (85%)</td>
<td>0.587</td>
</tr>
<tr>
<td>PBSC</td>
<td>4 (21%)</td>
<td>3 (15%)</td>
<td></td>
</tr>
</tbody>
</table>

| TNC count (x 10^9/ cells/kg) | 3.88 (1.23-22.80) | 2.96 (1.06-22.50) | 0.725 |
| CD34 count (x 10^6 cells/kg) | 3.19 (1.22-12)    | 5.96 (1.5-12.77)  | 0.298 |

### ABO mismatch (donor/recipient)

<table>
<thead>
<tr>
<th></th>
<th>Parents as donors</th>
<th>Siblings as donors</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5 (26%)</td>
<td>5 (25%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14 (74%)</td>
<td>15 (75%)</td>
<td></td>
</tr>
</tbody>
</table>

### CMV status (donor/recipient)

<table>
<thead>
<tr>
<th></th>
<th>Parents as donors</th>
<th>Siblings as donors</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pos/pos</td>
<td>9 (47%)</td>
<td>4 (20%)</td>
<td></td>
</tr>
<tr>
<td>Pos/neg</td>
<td>3 (16%)</td>
<td>1 (5%)</td>
<td></td>
</tr>
<tr>
<td>Neg/pos</td>
<td>5 (26%)</td>
<td>7 (35%)</td>
<td></td>
</tr>
<tr>
<td>Neg/neg</td>
<td>2 (11%)</td>
<td>8 (40%)</td>
<td></td>
</tr>
</tbody>
</table>

### GvHD prophylaxis

<table>
<thead>
<tr>
<th></th>
<th>Parents as donors</th>
<th>Siblings as donors</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT Cy/Tac/MMF</td>
<td>16 (84%)</td>
<td>14 (70%)</td>
<td></td>
</tr>
<tr>
<td>Tac/MMF</td>
<td>2 (11%)</td>
<td>3 (15%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1 (5%)</td>
<td>3 (15%)</td>
<td></td>
</tr>
</tbody>
</table>
Results

• 95% of patients in both groups achieved successful engraftment.
• 1(5%) in each group of the cohort had primary graft failure requiring a second transplant
Time to neutrophil engraftment

• 19 days (G1) Vs 17 days (G2) p=0.38
Time to platelet engraftment

• 16 days (G1) Vs 15 days (G2) p=0.63.

G1: parent donors  
G2: sibling donors
Acute GvHD

G1: 11/19 (57.9%)
G2: 9/20 (45%)
P=0.4

G1: parent donors
G2: sibling donors
Chronic GvHD

G1: parent donors
G2: sibling donors

G1: 7/19 (36.8%)
G2: 3/20 (19%)  
P=0.11
Survival analysis

• Survival analysis is performed in patients with **malignant conditions** only.
Event Free Survival (EFS)

5-year EFS
G1: 50.8%
G2: 51.3%
P=0.92

G1: parent donors
G2: sibling donors
Overall Survival (OS)

5-year OS
G1: 61.1%
G2: 58%
P=0.9

G1: parent donors
G2: sibling donors
Conclusion

• There is no difference in time to neutrophil or platelet engraftment between parents donors or siblings donors in haploidentical stem cell transplants of our cohort.

• There is a trend toward higher rate of chronic GvHD in the parents donors group compared to siblings donors group.

• However, this difference did not reach statistical significance.

• Larger studies are required to further evaluate these findings.
Study limitations

- Small numbers
- Retrospective nature
Acknowledgements

• Research Supervisors:
  • Dr. Jacob Rozmus
  • Dr. Kirk Schultz

• Statistician
  • Dr. James E. Potts

• BMT team
  • Dr. Amanda Li
  • Dr. Meera Rayar
  • Juliana Roden
  • Cass Managh
  • Ali Vavra

• Division of Hematology/Oncology/BMT
References

Incidence Of Outborn Babies Referred For Therapeutic Hypothermia In British Columbia Who Achieve Target Temperature During Transport Within 6 Hours Of Life

• Dr. Phanice Okara
• Neonatal Clinical Fellow
• Supervisor: Dr. Michael Castaldo
• UBC & BCWH
• Vancouver, BC, Canada
Introduction

• Hypoxic-Ischemic Encephalopahy (HIE) - brain injury due to impaired circulation to the brain during the perinatal period.

• Incidence: 1-2 in 1000 babies/year in the developed world

• 20% mortality rate, 40% neurodevelopmental impairments

• 45-78% of suspected HIE infants are outborn

• Therapeutic hypothermia (33.0-34.0°C) initiated within 6 hours of life, standard of care in acute moderate to severe HIE


Therapeutic Hypothermia in Neonatal transport

Cooling during transport:

• Passive cooling is defined as the process of switching off all external sources of heat e.g. overhead heater and incubator
• Active cooling is defined as the act of using external resources ice packs, ice gels or cooling machines.
• In BC, ITT undertakes all sick neonatal transfers
• ITT uses cool packs, less effective than servo-controlled

Study Objectives

1) To determine the proportion of outborn infants requiring therapeutic hypothermia for HIE achieved therapeutic temperature within 6 hours of life during transport

2) To determine the outcomes of outborn infants who require therapeutic hypothermia for HIE
Methodology

• Study design: Retrospective cross-sectional study

• Study population:
  • Inclusion criteria in line with CPS guidelines\(^4\)
    a. Outborn babies
    b. Babies more than 36 weeks gestational age
    c. Cord gas pH \(\leq 7.0\) or base deficit \(\geq 16\) or
    d. pH 7.01-7.15 or base deficit 10-15.9 in the cord gas or within the first hour of life and has a history of acute perinatal event or Apgar scores \(\leq 5\) at 10 minutes, or at least 10 minutes of positive pressure ventilation
    e. Evidence of moderate to severe encephalopathy, seizures or abnormal neurological exam

• Exclusion criteria
  • Inborn babies
  • Babies born less than 36 weeks
  • Babies with known significant congenital anomalies

• Study area: British Columbia Province, Canada

• Study tools: Canadian Neonatal Transport Network (CNTN) and Canadian Neonatal Network (CNN) records

• Study period: 2015 - 2020

4) Canadian Pediatric Society Position statement on Hypothermia for newborns with Hypoxic-Ischemic Encephalopathy, June 2018
Table 1: Baseline characteristics of out-born babies in British Columbia who required Therapeutic Hypothermia between 2015 and 2020

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age (median [IQR])</td>
<td>40.0 [39.0,40.0]</td>
</tr>
<tr>
<td>Gender (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>80 (54.4)</td>
</tr>
<tr>
<td>Female</td>
<td>67 (45.6)</td>
</tr>
<tr>
<td>Birth weight in g (median [IQR])</td>
<td>3430 [3107.0,3745.5]</td>
</tr>
<tr>
<td>Delivery type (CS delivery [%])</td>
<td>82 [55.5]</td>
</tr>
<tr>
<td>Apgar score at 10 minutes</td>
<td>5 [3,7]</td>
</tr>
<tr>
<td>HIE staging (%)</td>
<td></td>
</tr>
<tr>
<td>Stage I</td>
<td>37 (25.2)</td>
</tr>
<tr>
<td>Stage II</td>
<td>57 (38.8)</td>
</tr>
<tr>
<td>Stage III</td>
<td>31 (21.1)</td>
</tr>
<tr>
<td>Unknown stage</td>
<td>22 (15.0)</td>
</tr>
<tr>
<td>Seizures (%)</td>
<td></td>
</tr>
<tr>
<td>Definite</td>
<td>68 (46.3)</td>
</tr>
<tr>
<td>None</td>
<td>58 (39.5)</td>
</tr>
<tr>
<td>Suspected</td>
<td>21 (14.3)</td>
</tr>
<tr>
<td>Temperature at the Referring site on Transport team arrival (median [IQR])</td>
<td>34.70 [33.60,36.50]</td>
</tr>
<tr>
<td>Temperature during transport (median [IQR])</td>
<td>35.30 [33.75,36.60]</td>
</tr>
<tr>
<td>Admission temperature at the Tertiary NICU (median [IQR])</td>
<td>34.50 [33.60,36.40]</td>
</tr>
</tbody>
</table>
Table 2: Outcomes of outborn infants with HIE referred for therapeutic hypothermia in BC

<table>
<thead>
<tr>
<th>Category</th>
<th>Count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alive at discharge</td>
<td>112 (79.6)</td>
</tr>
<tr>
<td>In-hospital death</td>
<td>15 (10.2)</td>
</tr>
<tr>
<td>N/A</td>
<td>15 (10.2)</td>
</tr>
</tbody>
</table>
Table 3: MRI results amongst outborn babies with HIE in BC referred for therapeutic hypothermia

<table>
<thead>
<tr>
<th>Description</th>
<th>N=130 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal MRI report</td>
<td>41 (31.5)</td>
</tr>
<tr>
<td>Other MRI injuries not consistent with HIE</td>
<td>37 (28.5)</td>
</tr>
<tr>
<td>HIE specific injuries (Basal Ganglia/Thalamic injury, Diffusion Changes, Spectroscopic Changes, Watershed White Matter injury)</td>
<td>52 (40)</td>
</tr>
</tbody>
</table>
Summary of Results

- Only 16% of the babies reached target therapeutic temperature within 6 hours of life
- Median time to reach target therapeutic temperature was 11.8 hours
- Median tertiary NICU admission temperature was 34.5°C
- Only 31% of the MRI scans done were reported as normal
- 67% of the babies were discharged home
- 10.2% of all babies died
- 4.1% were referred to palliative care
Conclusion/Future direction

• Less than 1 in 5 outborn babies reach target therapeutic temperature within 6 hours
• About 40% of outborn babies referred for therapeutic hypothermia have HIE specific injuries on MRI
• 1 in 10 outborn babies referred for therapeutic hypothermia died at the time of discharge
• Going forward - Assess specific factors associated with delay in cooling during transport

Matthew Smyth (PGY-4) Robert Baird and Richard Schreiber
British Columbia Children’s Hospital, UBC
Resident Research Day, April 8th 2022
Biliary Atresia in British Columbia

Background

• Rare, idiopathic, rapidly progressive and life-threatening within the first few months of life.

• Fibrosclerosing obliteration of the intra and extrahepatic biliary ducts.

• Leading cause of cirrhosis, liver-related death and liver transplantation (LT) in children.

• Incidence 1/15-20,000 live births in North America
Background

- Survival with native liver (SNL) directly correlates with age at Kasai hepatportoenterostomy (KP)
- Best outcomes with early KP (<30 days of age)
- Variability of clinical presentation and lack of a diagnostic test challenge early diagnosis and timely KP.
- Novel screening programs have had limited success
- SNL rates 60-80% in some countries*

*Nio, M. Japanese Biliary Atresia Registry (2017)
Aims

- To assess age at presentation and investigations conducted prior to diagnosis for patients found to have Biliary Atresia (BA), and how both impact on timing of KP and outcome.

Methods

- Retrospective review of all patients referred to British Columbia Children’s Hospital between January 1st, 2000 and December 31st, 2018 with confirmed Biliary Atresia.
Biliary Atresia in British Columbia

Results: Incidence

- Total cases = 48
- 1-5 cases /year
- 28 Female (58%)
- Mean incidence*: 1/17,000 live births.

*Based on BC Vital Statistics
Results: Location at referral

• ~70% Referred from within Metro Vancouver (Fraser Health + Vancouver Coastal)

• 79% referred by community pediatrics, 11% from GP
Biliary Atresia in British Columbia

Biliary Atresia in BC: Outcome

Outcomes (N=48)

- Kasai Only (N=18) 37%
- Kasai then transplant (N=23) 48%
- Primary Transplant (N=7) 15%

BA: N=48

Kasai: N=41 (85%)

Primary Transplant N=7 (15%)

Survival with Native Liver: N=18 (44%)

Transplant: N=23 (56%), with 21 having early KP failure

2 Deaths 1 lost to follow-up
### Outcome by age at presentation

<table>
<thead>
<tr>
<th></th>
<th>DOL 3-38</th>
<th>DOL 40-76</th>
<th>DOL 79-166</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median age 18 days</td>
<td>Median age 52 days</td>
<td>Median age 98 days</td>
</tr>
<tr>
<td></td>
<td>N=17 (0-33%)</td>
<td>N=15 (33-67%)</td>
<td>N=16 (67-100%)</td>
</tr>
<tr>
<td>Kasai Procedures N (%)</td>
<td>16 (94%)</td>
<td>14 (93%)</td>
<td>11 (69%)</td>
</tr>
<tr>
<td>Median (IQR) Delay from presentation to Kasai</td>
<td>25.5 days (15-40)</td>
<td>7.5 days (3.75-12)</td>
<td>5.0 days (1-8)</td>
</tr>
<tr>
<td>Kasai Failure</td>
<td>8/16 (50%)</td>
<td>8/14 (57%)</td>
<td>7/11 (64%)</td>
</tr>
<tr>
<td>Mean (stdev) # of Investigations pre- Kasai</td>
<td>2.4 (0.86)</td>
<td>2.3 (0.80)</td>
<td>1.7 (1.3)</td>
</tr>
</tbody>
</table>

BA patients grouped into thirds based on age at presentation. Those presenting later underwent fewer investigations, with a more expedited KP. Older age at presentation correlated to lower rates of KP (those who did not undergo KP underwent primary LT) as well as higher rates of Kasai failure. *DOL= Day of Life **Investigations includes ultrasound, liver biopsy, HIDA scan, MRCP
Results: Age at Presentation and Time to Diagnosis

Patients who were older at initial encounter with Gastroenterology underwent KP after a shorter delay than those who presented younger.
Patients who were older at the time of Kasai were more likely to require liver transplantation \((p=0.08)\).

26 of 41 (63%) Kasai procedures occurred at <60 days of age.
Biliary Atresia in BC: Outcome by age at presentation
Outcome by Surgeon

The 41 Kasai Procedures were conducted by 7 different surgeons in the 19 years. The left graph shows the number of KP by each surgeon (range 1-10) and how many required a LT post KP. The right graph indicates the median age at KP for each surgeon.
Early screening success

- The BA stool card was introduced throughout the province in 2014
- Large scale public awareness campaign
- Given to postpartum parents to screen for acholic stools and contact their HCP or a centralized phone line

<table>
<thead>
<tr>
<th>Year of presentation</th>
<th>2000-2013 (N=35)</th>
<th>2014-2018 (N=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median (IQR) at presentation</td>
<td>55 days [29-86]</td>
<td>42 days [21.5-93.5]</td>
</tr>
</tbody>
</table>
Conclusions

• Survival with native liver (SNL) rate in BC is 37%, lower than rates in other national studies

• SNL rates higher when KP at a younger age, however only 63% of patients underwent KP <60 days

• Early findings from a provincial screening program suggest a shift in age at presentation, potentially owing in part to increased awareness of BA

• A diagnostic algorithm that accounts for age at presentation is needed to achieve timely KP.
Acknowledgements

• Canadian Biliary Atresia Registry (CBAR)

• Dr. Brenden Smith, for his birthday today.