

ABSTRACT SUBMISSION FORM

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Exploring the role of sex and gender on health research



CHR D 2020: Abstract Submission Form

Submitter Name

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Title

Outcome of the Glutaric aciduria type 1 (GA1) newborn screening program in Manitoba: 1980 – 2020

Background

Glutaric aciduria type 1 (GA1) is an inherited disorder overrepresented in Indigenous communities of northeastern Manitoba and northwestern Ontario. GA1 is an important cause of mortality and morbidity for children in our province. We identified a single mutation in the glutaryl-CoA-dehydrogenase gene (GCDH IVS-1 + 5g → t) in this population with a carrier frequency of 1 in 10, versus 1/150 worldwide. Aiming for presymptomatic diagnosis and treatment to prevent the encephalopathic crises (EC) characteristic of GA1, we implemented newborn screening (NBS) for GA1 in Manitoba. We report on the outcome of 40 years of NBS.

Objective

Determine the impact of GA1 NBS and presymptomatic management on neurodevelopmental outcome: 1980-2020

Methods

Our study population: Cohort 1 (20 patients) ascertained between 1980 and 2000 and cohort 2 (19 patients) ascertained between 2000 and 2019. Both cohorts followed the same recommended management except for the use of lysine-free special formula after the year 2000 versus protein-reduced formula prior. Clinical course data were abstracted from patients' Genetics and Metabolism files.

Results

The prevalence of EC fell to 60% over the last 20 years versus 90 % in the previous 20 years 1980-2000. Proportions with EC in each era were compared by Fisher Exact Test assuming a hypergeometric distribution. The odds ratio was 0.19 (0.02-1.2, $p = 0.06$). Although we note a trend of improvement in preventing EC, from 10% to 40%, this is not statistically significant and is different from the observed outcome in non-Indigenous patients.

Conclusion

Although we demonstrate a trend towards the prevention of EC since 2000, we remain below the desired outcome. There remain barriers to instituting emergency protocols that must be followed to prevent EC. Implementation of measures to overcome these barriers will include: adopting a holistic approach encompassing traditional values and culture, language-specific parental guides, disease education to care providers, development of a simple algorithm for management in the remote communities, and periodic workshops for care providers and communities involved.

Theme:

Clinical

Do you have a table/figure to upload?

Yes

Untitled

GA1 table.pdf

Are you willing to participate in Goodbear's Den?

Yes

Presenter Status:

Non-Trainee

What was your role in the project?

Design

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Table 1. GA1 newborn screening outcome updates

Ascertained before 2000	AEC	Insidious onset	Normal
Total of patients	19	2	0
Age range	6-12 months	Birth	0
Sex	10 F/9 M	2 F	0

Deceased	Alive	Total number
17	4	21
2 - 40 years	26 – 48 years	
9 F/8 M	3 F/1 M	

Ascertained after 2000	AEC	Insidious onset	Normal
Total of patients	12	3	4
Age range	6-12 months	Birth	8-12 years
Sex	8 F/4 M	3 M	3 F/1 M

Deceased	Alive	Total number
8	11	19
2-11 years	9 months – 20 years	
5 F/3 M	6 F/5 M	

Acute encephalopathic crisis (AEC)

Females (F)

Males (M)