Epidemiology and burden of illness in patients with Rett Syndrome in Ontario, Canada

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Introduction

- Rett Syndrome (RTT) is an X-linked neurodevelopmental disorder, characterized by gradual loss of motor, verbal and social skills, and the development of unique stereotypical hand movements [1].
- The estimated global incidence of RTT is 1 in 10,000 to 15,000 live female births [1,2], with a prevalence of 1 in 20,000 to 40,000 people [3]. In Canada, approximately 600 to 900 people have been affected by RTT [4].
- Until recently, therapy options for RTT were limited to managing comorbidities and symptoms. However, the use of trofinetide, a disease-specific pharmacological treatment shown to target and improve core RTT symptoms [5], was approved in Canada (2024) and USA (2023) [6,7].
- Limited information exists on the epidemiology and healthcare resource utilization (HCRU) of RTT in Canada.
- This study describes the epidemiology, demographics and HCRU incurred by patients with RTT in Ontario, Canada to fill the gaps in the literature and support future research in this area.

Methods

- This retrospective observational study identified RTT cases (ICD-10-CA code F84.2) in Ontario using administrative health records at ICES between September 1, 2018, and August 30, 2022, with index date being the earliest date of diagnosis.
- RTT cases were followed from index date until death, loss to follow-up in the ICES datasets, most recent data availability, or end of the study period (Figure 1).
- RTT cases were included if they were enrolled and observable in the ICES databases at least one year after their index date; valid OHIP card number at index date; and complete demographics (i.e., sex, postal code, age).
- Variables: demographics, relevant comorbidities, all-cause mortality, HCRU, prescription drug claims, including all-cause and disease-specific drugs.
- Descriptive statistics of variables of interest for the study population were calculated.
- Prevalence and incidence of RTT in Ontario were analyzed retrospectively for different 2-year follow-up periods including: 2017-2019[1],2019-2021, and 2021-2023.
- HRCU was analyzed as the number and proportion of cases with at least one touchpoint and as the total number of touchpoints observed during the follow-up period.

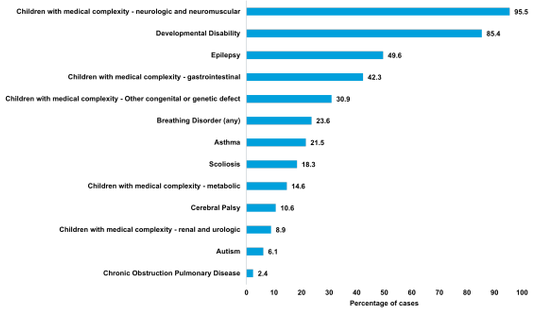
Results

Demographic and clinical characteristics

- A total of 246 RTT cases were included.
- RTT cases were predominantly female (95.1%), had a median age of 21 years (IQR 11-33), and a majority (40%) resided in central Ontario.
- The most common comorbidities among RTT cases included developmental disabilities (85.4%), epilepsy (49.6%), and gastrointestinal comorbidities (42.3%) **(Figure 1).**

To see footnotes and references click here

Figure 1. Comorbidities of cases with RTT



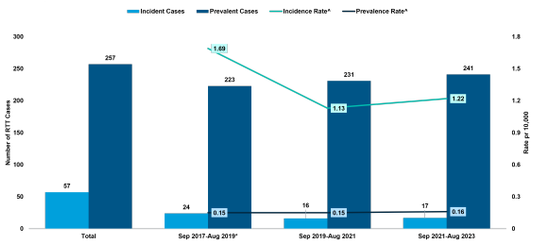
Incidence and Prevalence of RTT

- From September 2017 to August 2023, in Ontario there were a total of 57 incident RTT cases, with annual rates ranging from 1.13-1.69 cases per 10,000 births (**Figure 2**).
- The number of prevalent RTT cases in Ontario, accrued from 2002[2], was 257, with annual prevalence ranging from 0.15-0.16 per 10,000 people.

Healthcare Resource Utilization of RTT patients

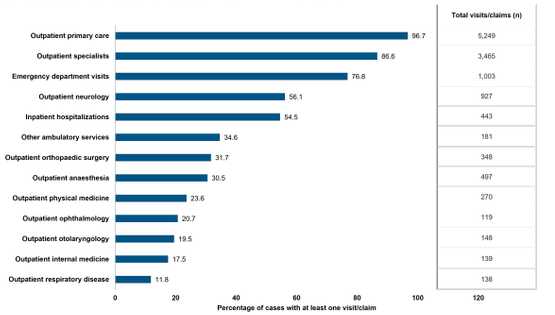
- During the 5-year follow-up period, most RTT cases had at least one outpatient primary care visit (96.7%) and one outpatient specialist visit (86.6%) (**Figure 3**).
- The most frequently visited specialists included neurologists (56.1%), followed by orthopedic surgeons (31.7%) and anesthesiologists (30.5%).
- Most cases also had at least one emergency department visit (76.8%) and one inpatient hospitalization (54.5%).
- The mean length of stay of inpatient hospitalizations was 7.9±18.09 days, with a maximum stay of 294 days.

Figure 2. Incidence and prevalence of RTT



*To provide rolling 24-month incidence and prevalence, one year of data was added to the first time period. Years were aggregated to avoid cell suppression due to low numbers of cases with the disease.
^Incidence rate per 10,000 births, using Statistics Canada Birth Rates; Prevalence rate per 10,000 people, using Statistics Canada Population Rates

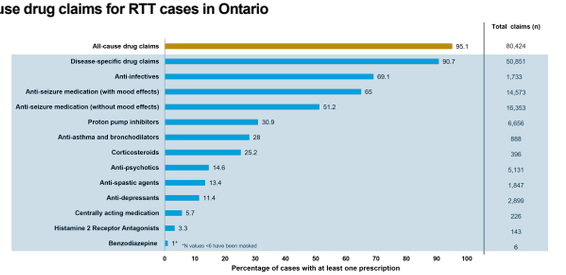
Figure 3. Healthcare resource utilization of cases with RTT in Ontario



Drug claims for RTT patients

- 95.1% of the cases had at least one public claim for all-cause medication (**Figure 4)**
- There was a total of 80,424 all-cause drug claims, representing a median of 114 claims per patient.
- Many cases (90.7%) claimed at least one disease-specific medication, with a total of 50,581 disease-specific drug claims.
- Disease-specific drug claims were predominantly for antibiotics (69.1%) and anti-seizure medications with mood effects (65.0%) and anti-seizure medications without mood effects (51.2%).

Figure 4. All-cause drug claims for RTT cases in Ontario



Conclusions

- This study provided for the first time the population-based estimates of RTT in Ontario and its associated burden of illness.
- The number of incident RTT cases from 2017 to 2023 was low, while the annual number of prevalent RTT cases remained stable.
- RTT is associated with high rates of comorbid conditions and HCRU, resulting in high burden of illness.
- The high rates of antibiotics and anti-seizure medication used in this study suggest an urgent need for treatment options.