Hospitalization for Autism Spectrum Disorder (ASD) in the 100 million Brazilian Cohort

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1,686 people from the 100 million Brazilian cohort were hospitalized with ASD over a 10-year period. The profile varied according to sex. Although most of the sample consisted of males, females had higher incidence rates of hospitalization due to any comorbidity and premature mortality.

BACKGROUND

- ASD is a neurodevelopment disability that is related with problems in social communication and interaction[1]. One in 100 children has ASD in worldwide[1].

- Compared to the general population, people with ASD face multiple health and mental health issues, often leading to hospital admissions due to difficulties in identifying comorbidities[2]. Additionally, they are at higher risk of premature death[3].

- Individuals with ASD need several support services especially health service such as outpatient and inpatient health care and other kind of hospital-based service[4].

- This is a challenge for Low- and Middle-Income Countries (LMIC) because the treatment is very expensive for the health system and the provision of health services is not always adequate to the number of inhabitants[5].

- In Brazil, there is an insufficient supply of community-based mental health centers for people with ASD and general hospitals can be the only option[5].

- Given the rise in ASD prevalence and treatment challenges[1], particularly due to insufficient outpatient services in LMIC[5], understanding the profile of hospital admissions for individuals with ASD is crucial.

- Aim of the study: to investigate the profile of people hospitalized for ASD in the 100 million Brazilian cohort and to identify their overall mortality and comorbidities rates.

METHODS

- Design: population-based cohort study based on health and social administrative data linked from the baseline of the 100 million Brazilian cohort developed by the CIDACS-Fiocruz[6]. This is a dynamic cohort composed by individuals who applied for social benefits in the Brazilian Government Unified Register for Social Program (CadÚnico) between 2001 and 2018.

- Participants: 1,686 individuals who were registered in the 100 Million Brazilian Cohort and admitted at the hospital for ASD (ICD-10 code F84) from 2008 and 2018.

- Follow-up: it started upon registration at CadUnico and after a record of hospitalization for ASD in the Hospitalization Information System (SIH). Follow-up ended either when the following reason for leaving (censorship) occurred at the earliest of: the individual's death by any cause; or on 31 December 2018.

- Statistical Analyses:

1) Descriptive analysis comparing the groups of males and females considering the strong association between ASD and male sex using Pearson chi-square (p <0.05).

2) Estimation of the incidence ratios for premature mortality (overall) and comorbidities (anyone, physical and psychiatric) starting in the date of hospitalization and end in 2018, using person-time as denominator (stratified age and sex).

RESULTS

- Among 1,686 individuals were hospitalized for ASD, the majority was male (Fig. 1).

- When compared with female, they were younger, never studied, were white, lived in urban area and in the Southeast of Brazilian regions (Fig. 1).

- Males spent more time at the hospital and were more diagnosed with childhood autism than females (Fig. 1).

- The most common physical comorbidity was disease of the digestive system, while the most common psychiatric comorbidity was intellectual disability in both sexes (Fig.1).

- Diseases of the nervous system and respiratory system were the most common causes of death in both sexes (Fig. 1).

- Although the sample was predominantly male, the incidence rates of hospital admission due to any comorbidity and overall mortality were higher among women (Table 1).

- Males had a higher incidence rate of hospitalization for physical comorbidity, while females had a higher rate of hospitalization for psychiatric comorbidity (Table 1).

- Regarding age, males tended to have higher incidence rates at older ages (except for physical comorbidities), while females tended to have higher incidence rates at younger ages (except for psychiatric comorbidities) (Table 1).

References:
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RESULTS CONTINUED

Figure 1- Description of people who were hospitalized for ASD by sex, 2008-2018 (1,686)

Females
- Age (mean, SD): 13.27, 12.40*
- Educational Level (Years): Never studied (61.08%)
- Race: White (57.49%), Brown (35.33%)*
- Location of residence: Urban (86.23%)*
- Brazilian regions: Southeast (56.89%)*
- Length of the hospitalization (days): < than 5 days (83.43%)*
- Comorbidities: physical (disease of digestive system: 92.3%), psychiatric (intellectual disability: 80%)
- Causes of premature death: diseases of nervous system (27%) and respiratory system (23%)
- Subtypes of ASD: Childhood Autism (47.31%), Atypical autism (18.96%)

Males
- Age (mean, SD): 11.82, 10.85*
- Educational Level (Years): Never studied (54.01%)
- Race: White (54.43%), Brown (39.83%)*
- Location of residence: Urban (90.38%)*
- Brazilian regions: Southeast (56.37%)*
- Length of the hospitalization (days): < than 5 days (75.02%)*
- Comorbidities: physical (disease of digestive system: 78.5%), psychiatric (intellectual disability: 76.4%)
- Causes of premature death: diseases of nervous system (23%) and respiratory system (23%)
- Subtypes of ASD: Childhood Autism (59.16%), Atypical autismo (17.81%)

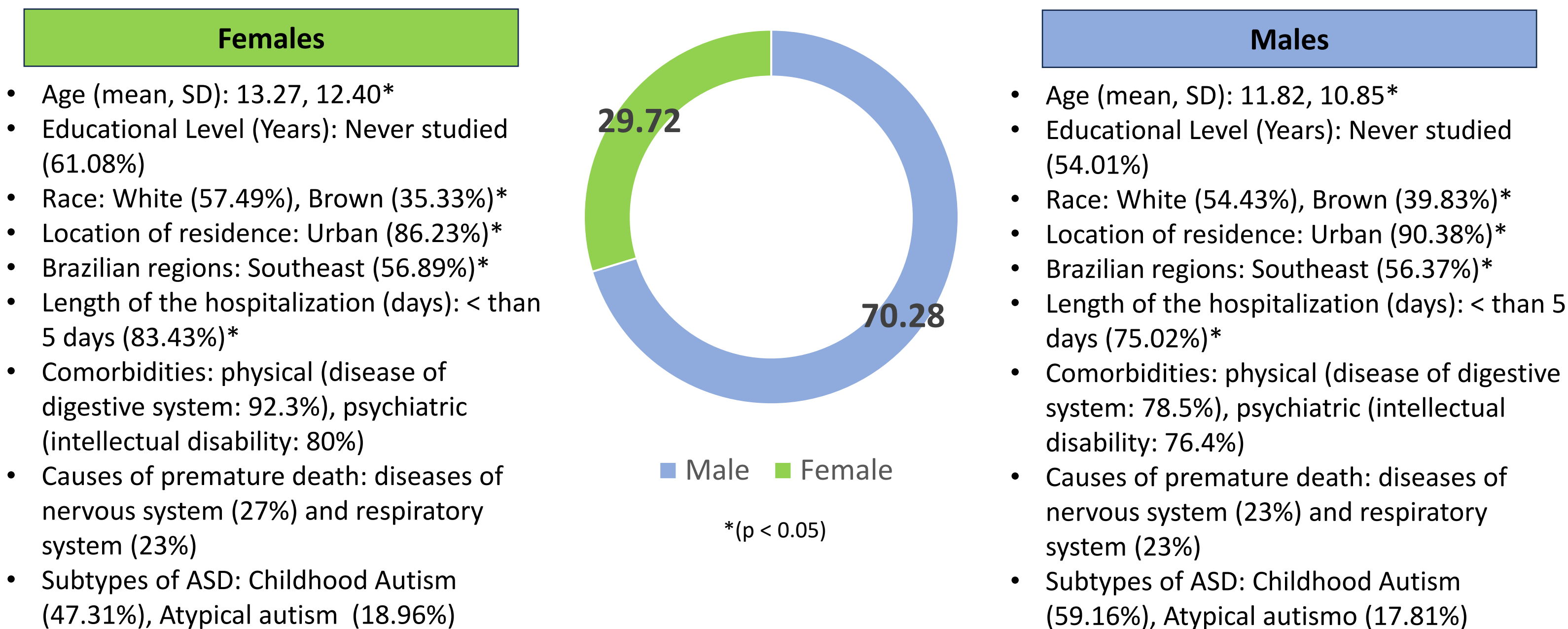29.72 / 70.28 — ■ Male ■ Female

*(p < 0.05)

Table 1 – Incidence rates for any, psychiatric and physical comorbidities and overall mortality among people hospitalized for ASD by sex and age, 2008-2018.

Variables	Male (N= 1185)			Female (N= 501)		
	Events	Person-year	Incidence rate* (95% CI)	Events	Person-year	Incidence rate* (95% CI)
Any comorbidity	87	5060.84	1719.08 (1393.28 – 2121.07)	38	2166.51	**1753.97 (1276.26 – 2410.49)**
Age (years old)						
< 5	09	1496.35	601.46 (312.95 – 1155.96)	20	849.97	**2353.04 (1518.08 – 3647.23)**
6 -10	14	709.31	1973.74 (1168.95 – 3332.61)	06	612.05	980.32 (440.42 – 2182.07)
11- 24	44	2005.21	2194.28 (1632.93 – 2448.60)	04	204.13	1959.58 (735.46 – 5221.10)
> 25	20	849.97	**2353.04 (1518.08 – 3647.23)**	18	887.47	2028.24 (1277.88 – 3219.21)
Psychiatric comorbidities	17	5060.84	335.91 (208.82 – 540.35)	10	2166.51	**461.57 (248.35 – 857.85)**
Age (years old)						
< 5	03	1496.35	200.49 (64.66 – 621.62)	02	612.05	326.77 (81.72 – 1306.58)
6 -10	02	709.31	281.96 (70.52 – 1127.41)	01	204.13	489.89 (69.01 – 3477.79)
11- 24	06	2005.21	299.22 (134.43 – 666.03)	03	887.47	338.04 (109.02 – 1048.12)
> 25	06	849.97	**705.91 (317.14 – 1571.27)**	04	462.87	864.17 (324.34 – 2302.50)
Physical comorbidities	70	5060.84	**1383.17 (1094.30 – 1748.29)**	28	2166.51	1292.40 (892.35 – 1871.80)
Age (years old)						
< 5	06	1496.35	400.97 (180.14 – 892.52)	04	612.04	653.54 (245.28 – 1741.31)
6 -10	12	709.31	1691.78 (960.78 – 2978.96)	03	204.12	1469.68 (474.01 – 4556.85)
11- 24	38	2005.21	**1895.06 (1378.92 – 2604.39)**	15	887.47	**1690.20 (1018.96 – 2803.61)**
> 25	14	849.96	1647.13 (975.51 – 2781.12)	06	462.87	1296.26 (582.35 – 2885.30)
Premature mortality	35	5060.84	691.58 (496.55 – 963.22)	22	2166.51	**1015.45 (668.63 – 1542.19)**
Age (years old)						
< 5	04	1496.35	267.32 (100.33 – 712.24)	04	612.05	653.54 (245.29 – 1741.31)
6 -10	03	709.31	422.94 (136.40 – 1311.37)	03	204.12	**1469.68 (474.01 – 4556.85)**
11- 24	15	2005.21	748.05 (450.97 – 1240.82)	10	884.47	1126.80 (606.28 – 2094.21)
> 25	13	849.97	**1529.47 (888.10 – 2634.04)**	05	462.87	1080.21 (449.61 – 2595.24)

*Estimated rates per 100,000.

CONCLUSIONS

- This study identified that 1,686 participants from the 100 million Brazilian cohort were hospitalized with ASD over a 10-year period.

- Females showed higher rates of hospitalization for any comorbidity and premature mortality, highlighting a profile of greater vulnerability to illness and death.

- This study contributes to identifying hospitalizations for ASD among individuals living in poverty and extreme poverty using real-world data.

ADDITIONAL KEY INFORMATION