A retrospective review of all children admitted with acute severe asthma to the paediatric intensive care unit, Red Cross War Memorial Children's Hospital between 2009-2019

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BACKGROUND & AIM

Asthma is one of the commonest chronic conditions of childhood and affects children worldwide. The majority of children who experience an acute exacerbation of asthma do not require admission to a paediatric intensive care unit (PICU).

There is limited data on the admission rates, treatment modalities and length of PICU stay, for children who have acute severe asthma (ASA) in a South African context. In this study, we aim to describe the patient profiles and treatment of all children admitted to the PICU with ASA.

METHODS

We conducted a retrospective audit of all children admitted with ASA to the paediatric intensive care unit at Red Cross War Memorial Children's Hospital in Cape Town, South Africa between 01 January 2009 - 31 December 2019.

RESULTS

There were 14592 PICU admissions over the 11-year period, of which 180 admissions (1,2%) were for acute severe asthma.
Nearly all the patients received nebulisations, steroids, and magnesium sulphate before PICU admission.
Half of the patients were loaded with IV salbutamol (n=96; 53,3%). About a third (n=61; 34%) received a salbutamol infusion before admission to PICU. Similar proportions received nebulisations and steroids in PICU, 34 patients (19%) received magnesium sulphate again in PICU and a total of 130 patients (72,2%) received a salbutamol infusion.
Most children received non-invasive respiratory support (n=167; 90,3%), and 18 children (9,7%) required mechanical ventilation for a median (IQR) of 3 (2 – 4) days. The median PICU stay was 1 (IQR 1 – 2) days and median hospital stay was 4 (IQR 3 – 6) days. No children died.

Figure 1: Number of admissions to PICU (n = 180)

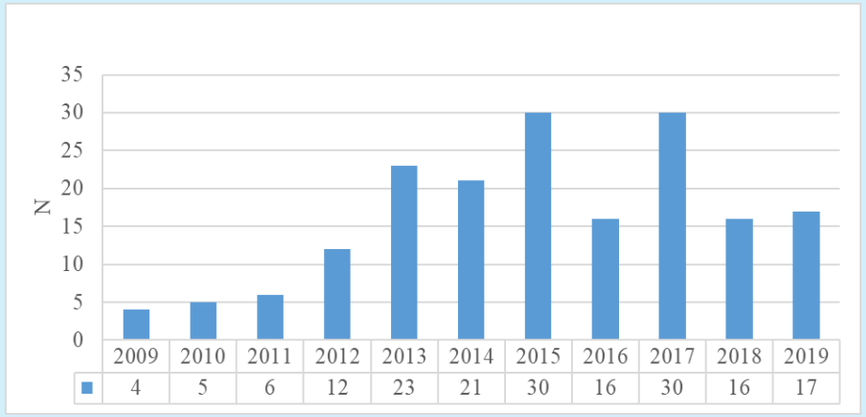

Figure 2 Respiratory support per year

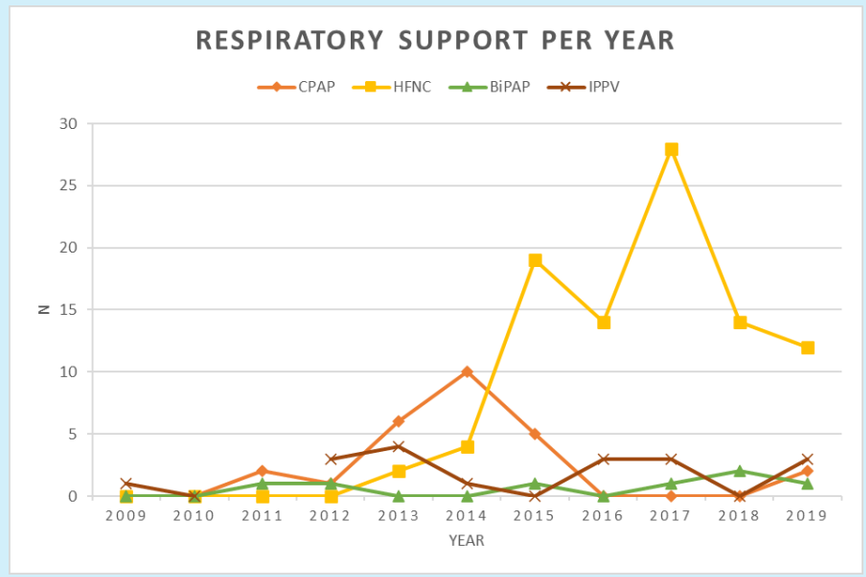

Table 1: Demographic and clinical characteristics (n=180)

Variable	n (%)
Gender	
Male	96 (53,3)
Age in months	
0-24	15 (8,3)
25-72	103 (57,3)
73-120	44 (24,4)
121-192	18 (10)
Weight (kilogram), median (IQR)	17 (14-25)
Nutritional status	
Appropriate weight for age	162 (90)
Underweight for age	12 (6,7)
Overweight for age	6 (3,3)
Diagnosis status	
Newly diagnosed asthmatic	83 (46,1)
Known asthmatic	97 (53,9)
Compliance	
Compliant	37 (20,6)
Non-compliant	60 (33,3)
Not applicable	83 (46,1)
PICU admission days, median (IQR)	1 (1-2)
Hospital admission days, median (IQR)	4 (3-6)

DISCUSSION

Our 11-year review of children admitted to the PICU with ASA shows an increasing trend in admissions and increasing use of non-invasive ventilatory support. Recent reports show an increasing number of children requiring admission to PICU in several countries worldwide.

CONCLUSION

Our study shows that annual ASA admissions to the PICU have increased over the study period. Despite the increase in admissions, the outcomes are comparable to international standards, with children only requiring a short PICU admission. We have seen an overall increase in the use of NIV respiratory support, mainly HFNC.

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