



Sepsis epidemiology and outcome in PICU of Vilnius University Children Hospital



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BACKGROUND

Sepsis being the most common cause of children death is a challenge for most physicians. It is important to know the aetiology and peculiarities of sepsis in a particular region and hospital to improve the outcomes. The aim of this study was to analyse the outcomes of sepsis in PICU and their relations with patient's characteristics and causative microorganisms.

METHODS

A retrospective analysis of Sepsis Registration System in Vilnius University Children hospital was started in 2012.

We found 674 sepsis cases in our hospital (registered in the system using ICD-10) during year 2012-2016.

Two hundred forty-three cases were found to be fulfilling all of our inclusion criteria and were included to final analysis:

- Patient's age above 28 days on admission,
- Taken blood culture or positive PCR test;
- Need for Paediatric Intensive Care Unit (PICU) hospitalization.

RESULTS

About 69% of cases treated in PICU were community-acquired sepsis (CAS) cases with previously healthy children. Demographic data of sepsis patients is shown in Table No. 1.

Most of the hospital-acquired sepsis (HAS) cases were a complication of immunosuppressive therapy in oncologic or hematologic patients (24% all PICU sepsis cases), whereas others were suffering from congenital abnormalities or neurologic co-morbidities, such as cerebral palsy (Fig. 1).

Etiology of sepsis was confirmed in 66% of sepsis cases. Most common microorganism was *Staphylococcus* spp., as well as *N. meningitidis*.

Staphylococci and other cocci were responsible for most of the HAS cases, whereas *N. meningitidis* was the most common bacteria causing CA sepsis. Gram negative rods were responsible for minority of sepsis cases in both patients groups (Fig. 2).

Table No. 1

	All patients	CAS	HAS	Lethal cases
Age, median	2,4	1,4	2,2	3,7
Sex, M:F	1,5:1	1:0,7	1:1	1,2:1
Length of stay in-hospital mean, d	18	14	51	15
Length of stay in PICU mean, d	2,5	2	8,9	4
Underlying co-morbidity %	31	0	100	50
Case fatality, %	15,6	12	23	-

RESULTS

Fig. 1

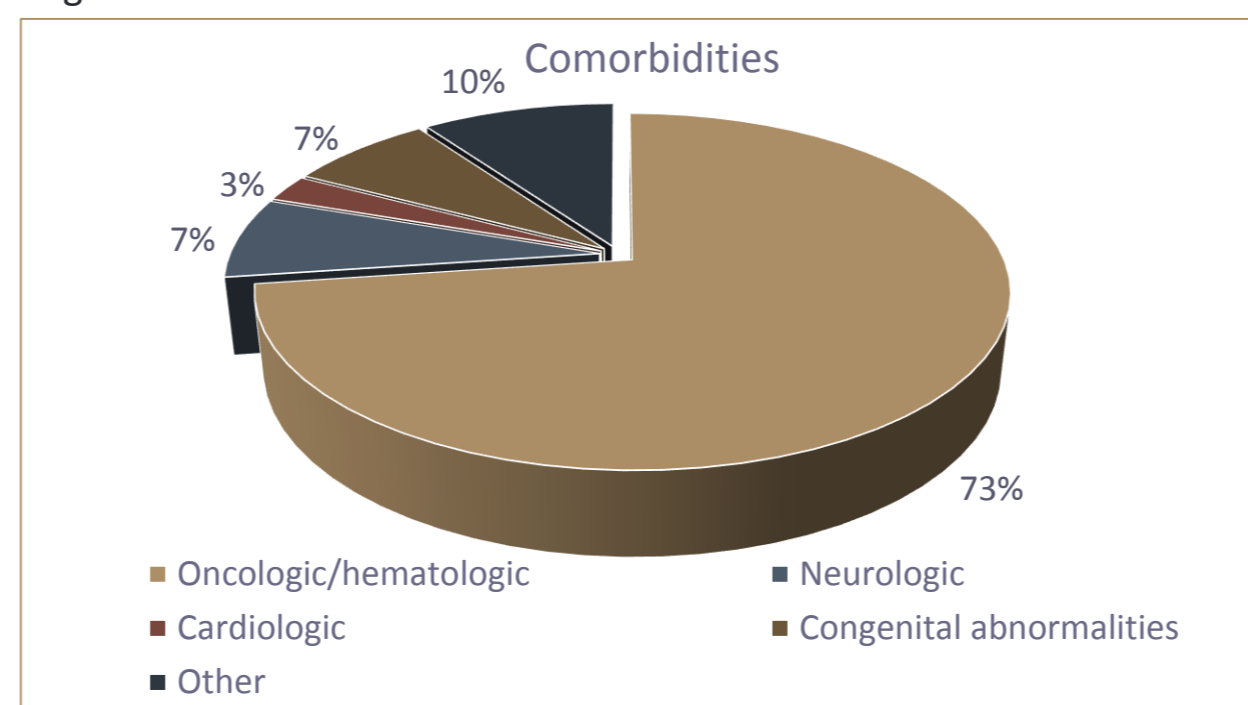
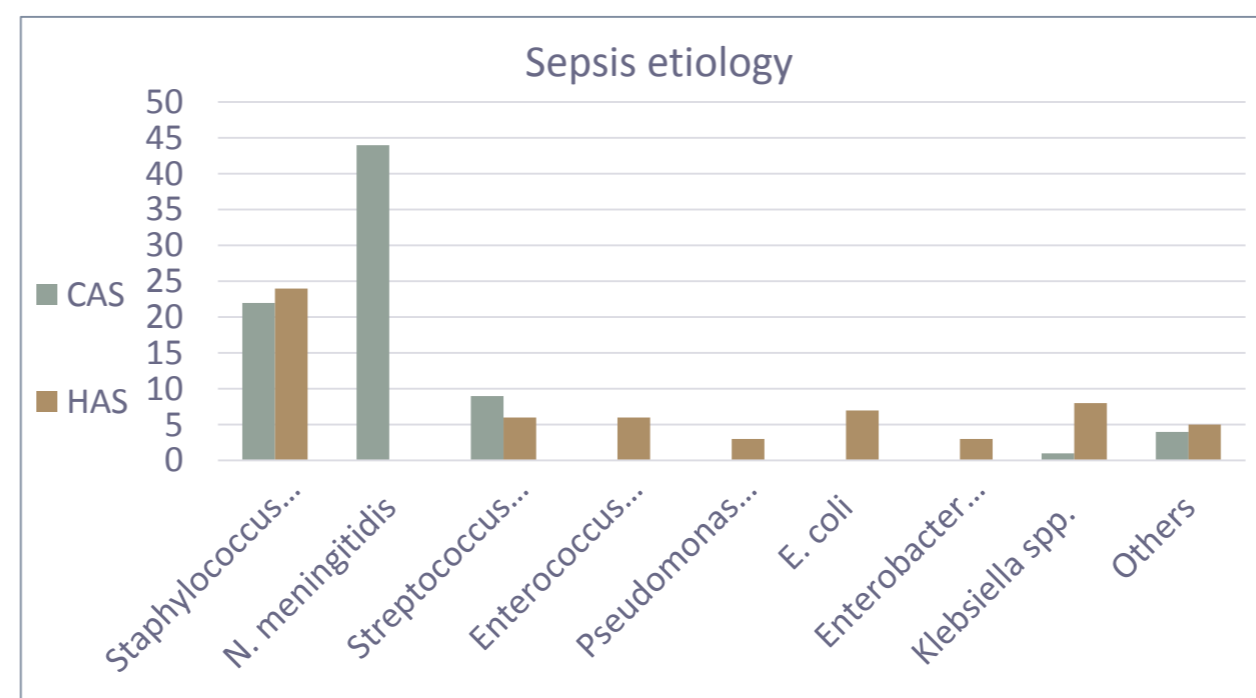


Fig. 2



About 85% of PICU sepsis cases were treated successfully with good outcomes. Statistically significant difference was found when analysing sepsis outcomes in different patient groups ($p < 0.05$). More than 88% of CAS patients survived; in comparison with 77% HAS patients (Fig. 3).

Most common causative microorganisms in the cases of lethal sepsis were *Staphylococcus* spp. and *N. meningitidis* (Fig 4).

Most of lethal outcomes in the CAS group were due to fulminant meningococemia, the most common causative microorganism of lethal sepsis was *Staphylococcus* spp. in the HAS group.

RESULTS

Fig. 3

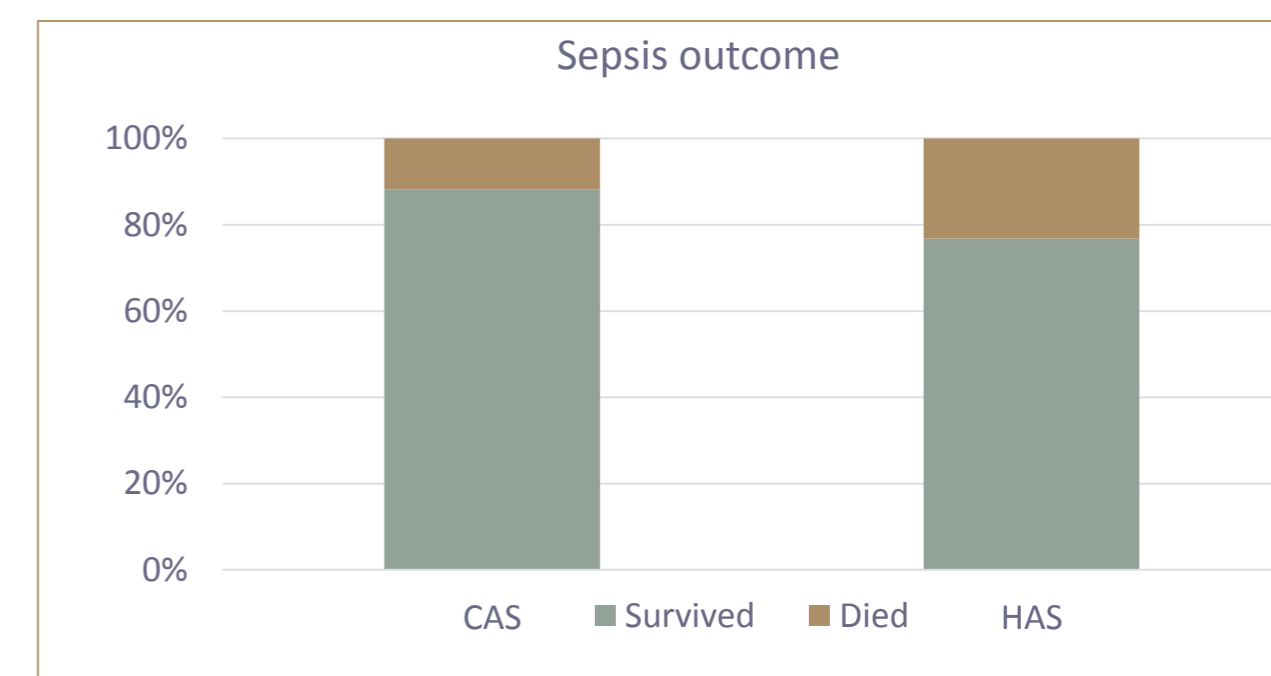
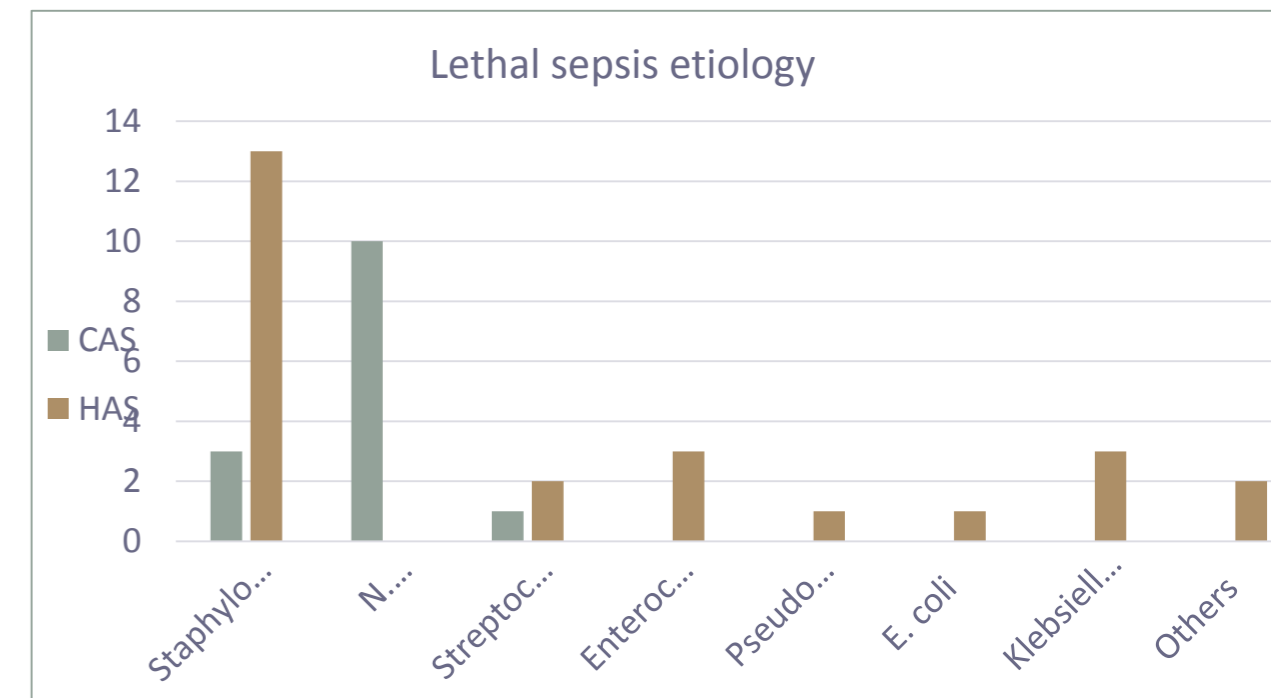


Fig. 4



CONCLUSIONS

Sepsis made 4,6% of all PICU patients in the period of 2012-2016.

Paediatric mortality reached 15,6% of all sepsis cases in our analysis, majority due to hospital-acquired sepsis that occurred in patients suffering from oncologic or hematologic diseases. Other significant part of the patients that did not survive were previously healthy with no co-morbidities.

Most common microorganism in lethal community-acquired cases was *Neisseria meningitidis* and in hospital-acquired sepsis - *Staphylococcus* spp.

Significant multi-drug resistance was noticed, especially in hospital acquired sepsis cases.