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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/11825
DOI URL: <http://dx.doi.org/10.21474/IJAR01/11825>



RESEARCH ARTICLE

AUDIT OF SEPSIS IN AN INDIAN TERTIARY CARE CENTRE

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Manuscript Info

Manuscript History

Received: 05 August 2020
Final Accepted: 10 September 2020
Published: October 2020

Abstract

Our audit titled “audit of sepsis in an Indian tertiary care Center” was conducted to assess the percentage of patients in whom the SEPSIS 1 HOUR BUNDLE was followed in our emergency and the steps taken to improve it in our hospital. The study was conducted in a tertiary care center “Peerless Hospital and B.K.Roy research center”, Kolkata, India. The sample size for the audit is 132. The study was conducted over a period of 1 year . As per the Surviving Sepsis guidelines 2017, it was said that the initial resuscitation for sepsis should begin within 1 hour of recognition of sepsis, to decrease the mortality. The components of surviving sepsis bundle is IV crystalloid infusion, blood cultures, IV antibiotics, lactate measurement and early initiation of vasopressors to maintain MAP >65mmHg. From the above study period of 1 year, 67% of the patients were above 60 years and 33% of the patients were below 60 years of age. With this guideline reference, in our audit, we found that 66% of patients received IV crystalloids within 1 hour, in 23% of patients lactate was measured within 1 hour of recognition, blood cultures were taken within 1 hour in 49% of patients, 46% of patients received antibiotics within 1 hour. The lack of awareness regarding the importance of lactate clearance has led to delay in lactate measurement and only 23% of patients had lactate measured within 1 hour. All Emergency departments should have a sepsis lead and a sepsis protocol. Education and training about the importance of 1 hour bundle should be done for wider team for early recognition and instigation of optimal care.

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Introduction:-

Sepsis is defined as suspected or confirmed infection with evidence of systemic inflammation and organ dysfunction.

Early recognition of sepsis is critical to the patient outcome. All patients with suspected sepsis should undergo immediate screening of sepsis.

Standardized pathways of care should be made for patients fulfilling sepsis criteria, to improve timely delivery of care and therefore outcome.

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Sepsis 1 Hour Bundle:



Initial resuscitation for sepsis and septic shock (begin immediately)

- 1 Measure lactate level*
- 2 Obtain blood cultures before administering antibiotics
- 3 Administer broad-spectrum antibiotics
- 4 Begin to rapidly administer 30mL/kg crystalloid for hypotension or lactate ≥ 4 mmol/L

*Remeasure lactate if initial lactate elevated (>2 mmol/L)

Sepsis: Infection (documented or suspected), and some of the following:

General Parameters:

Fever (temperature $>38.3^{\circ}\text{C}$)

Hypothermia (temperature $<36^{\circ}\text{C}$)

Pulse rate (>90 beats/min or >2 SDs above the normal value for age)

Tachypnea

Altered mental status

Significant edema or positive fluid balance (>20 mL/kg during 24 h)

Hyperglycemia (plasma glucose >140 milligrams/dL or 7.7 mmol/L) in the absence of diabetes

Inflammatory Parameters:

Leukocytosis (WBC $>12,000$ cells/ μL)

Leukopenia (WBC <4000 cells/ μL)

Normal WBC with $>10\%$ immature forms

Plasma C-reactive protein (CRP) >2 SDs above the normal value

Plasma procalcitonin >2 SDs above the normal value

Hemodynamic Parameters:

Arterial hypotension (SBP <90 mm Hg, MAP <70 mm Hg, or an SBP decrease >40 mm Hg in adults or <2 SDs below normal for age)

Organ Dysfunction Parameters:

Arterial hypoxemia ($P_{a\text{O}_2}/F_{\text{I}\text{O}_2} <300$)

Acute oliguria (urine output <0.5 mL/kg per hour for at least 2 h despite adequate fluid resuscitation)

Creatinine level increase >0.5 milligrams/dL

Coagulation abnormalities (INR >1.5 or aPTT >60 s)

Ileus (absent bowel sounds)

Thrombocytopenia (platelet count $<100,000$ cells/ μL)

Hyperbilirubinemia (plasma total bilirubin >4 milligrams/dL)

Tissue Perfusion Parameters:

Hyperlactatemia (above upper limits of laboratory normal levels)

Decreased capillary refill or mottling

Purpose Of The Study:

To assess the percentage of patients in whom the SEPSIS 1 HOUR BUNDLE was followed in our emergency and the steps taken to improve it.

Data Study Period:

January 2018 – December 2018

Total Population:

Male:72

Female:60

Inclusion Criteria:

Age group 16years and above, any of general parameters with any of the inflammatory parameters with any of the organ dysfunction parameter

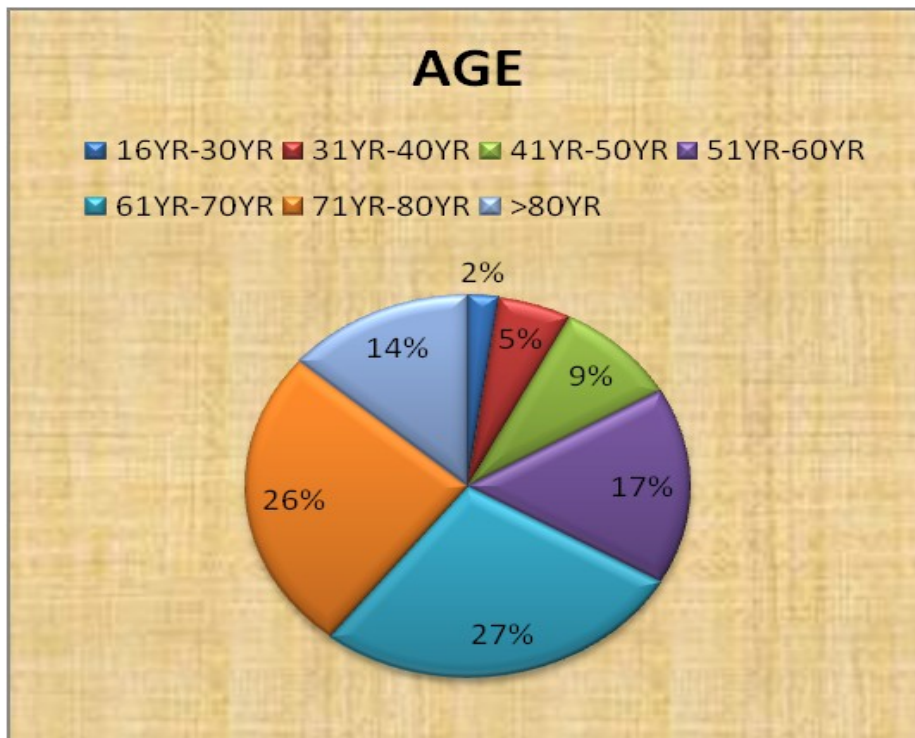
Exclusion Criteria:

Age<15 years

Patient not diagnosed with severe sepsis or septic shock in emergency.

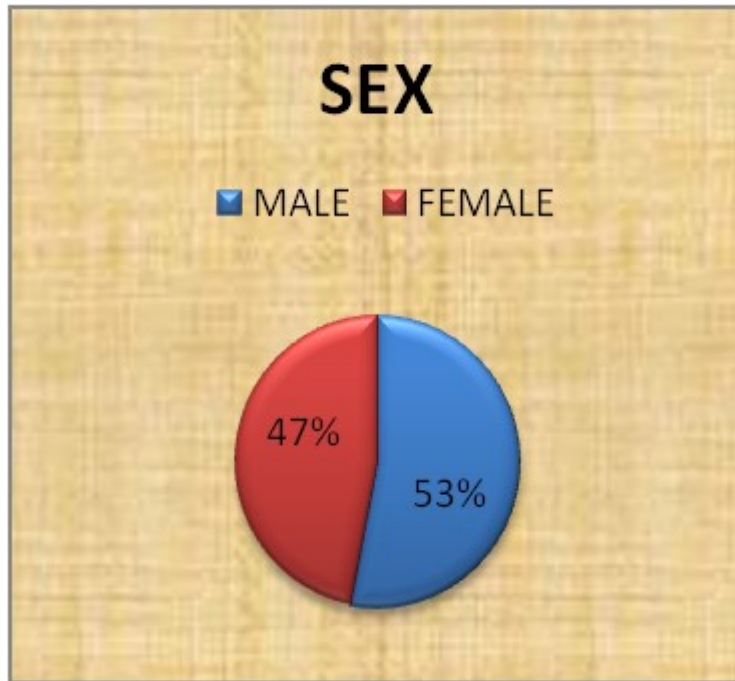
Patient with hypoperfusion or hypotension without evidence of sepsis.

Age Group:



16yr-30yr: 2%
31yr-40yr 5%
41yr-50yr: 9%
51yr-60yr: 17%
61yr-70yr: 27%
71yr-80yr: 26%
>80yr: 14%

Sex:

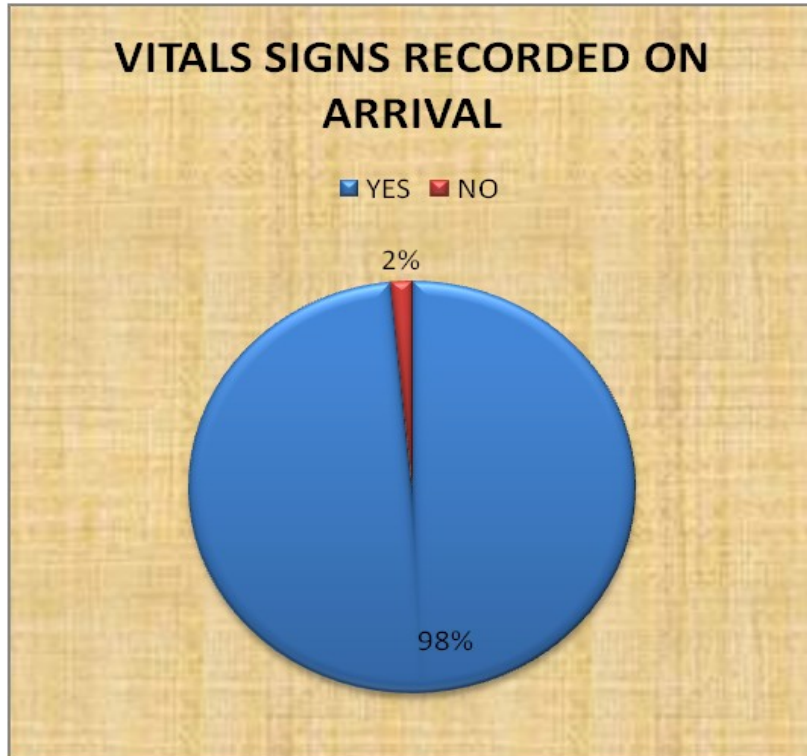


Male – 53%
Female – 47%

Date:

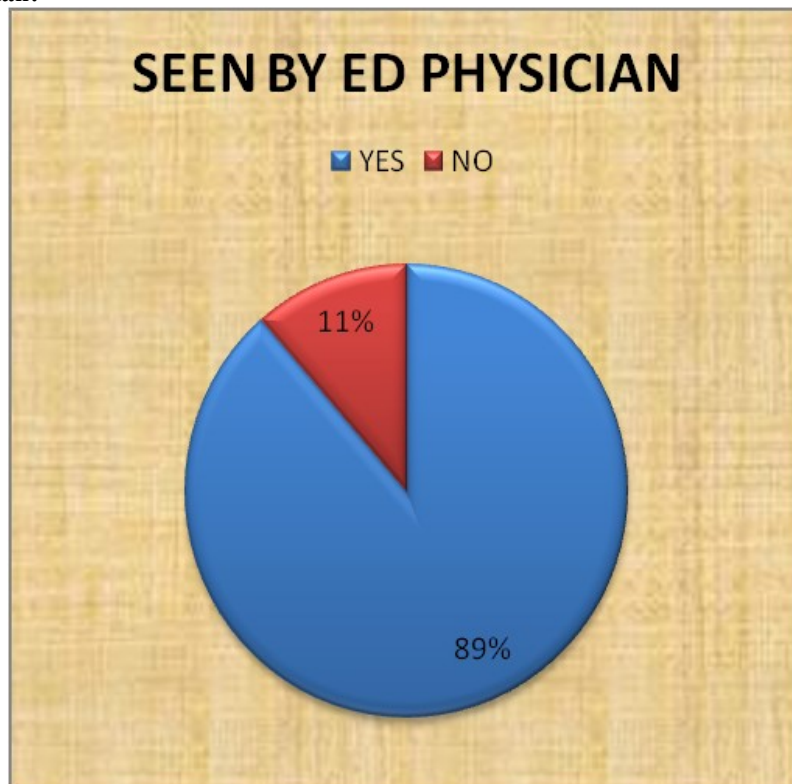
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MON	5	3	10	8
TUE	2	2	4	10
WED	5	5	5	5
THU	1	6	9	6
FRI	NIL	2	13	8
SAT	2	5	8	4
SUN	5	7	5	3

Vitals Signs Recorded On Arrival:



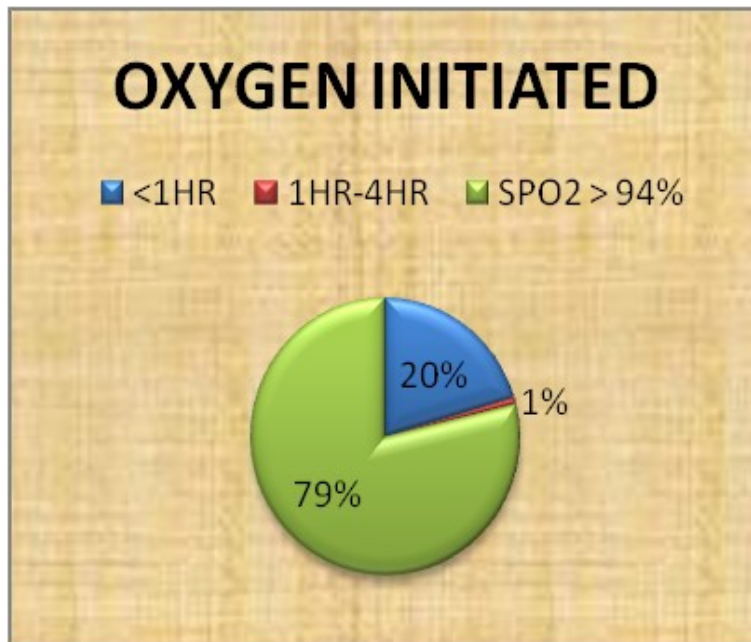
Yes: 98%
No: 2%

Seen By Ed Physician:



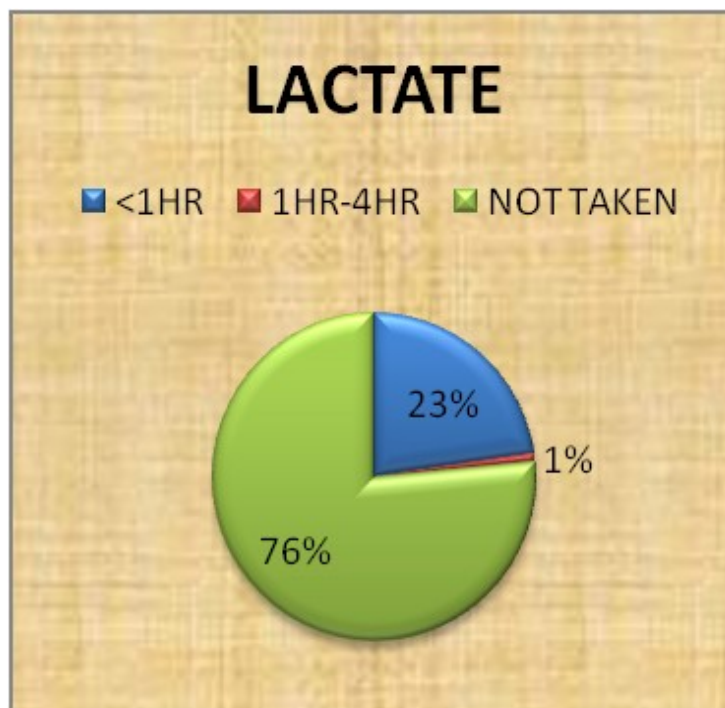
Yes: 89%
No: 11%

Oxygen Initiated:



<1hr: 20%
1hr-4hr: 1%
spo2> 94%: 79%

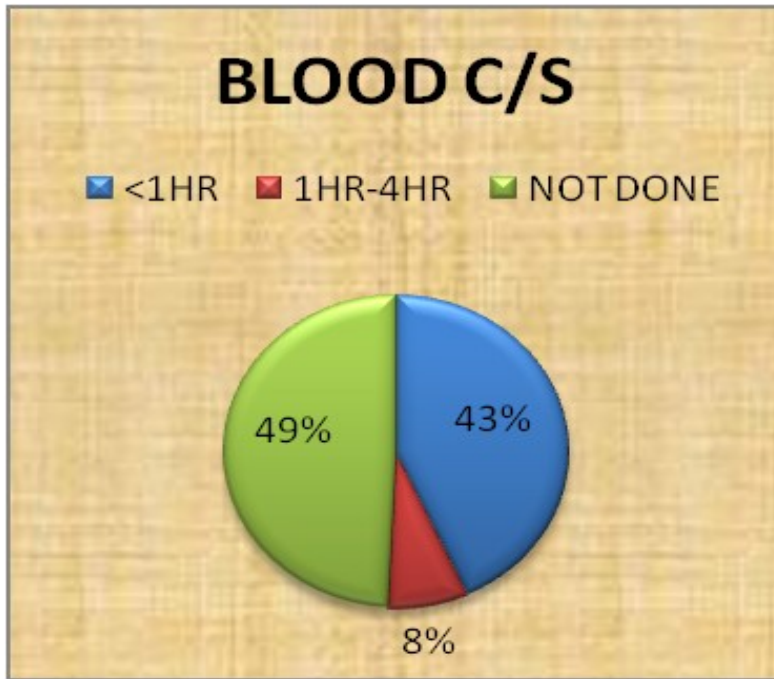
Lactate:



<1hr: 23%
1hr-4hr: 1%

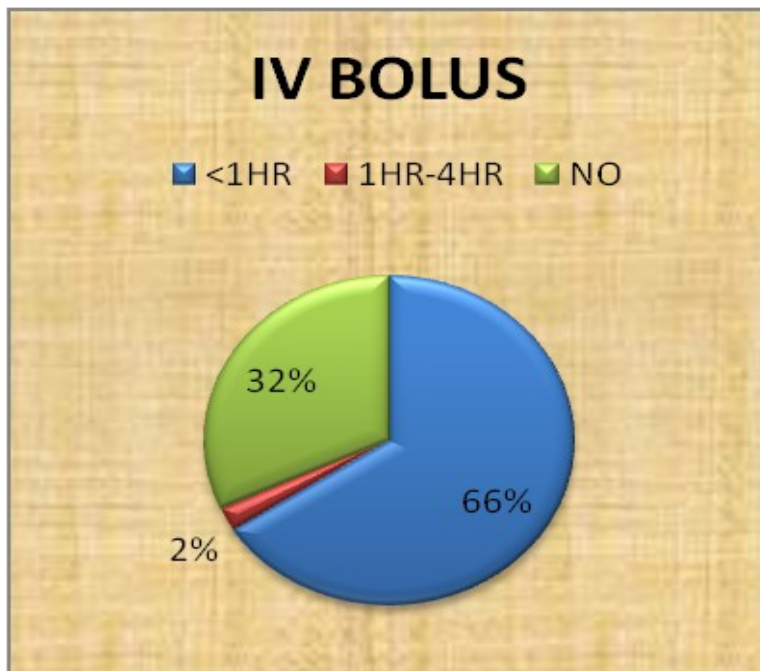
Not taken: 76%

Blood C/S:

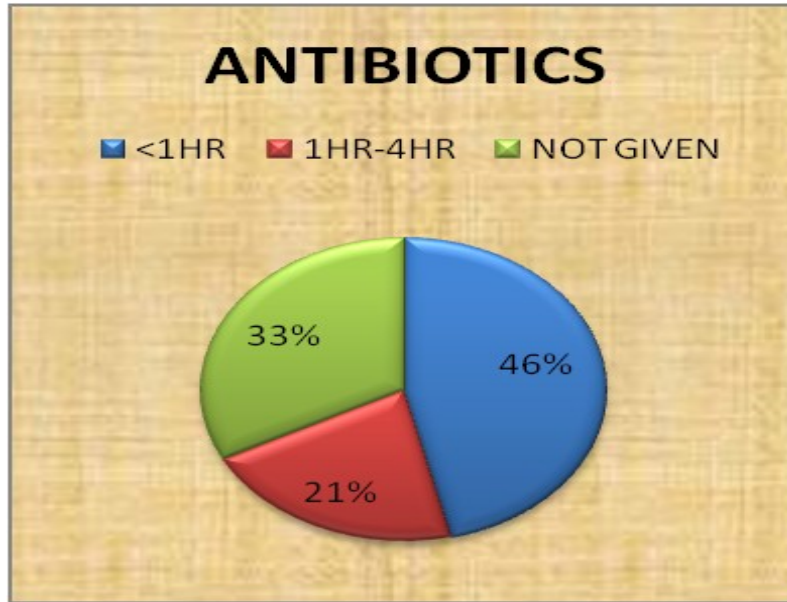


<1hr: 49%
1hr-4hr: 8%
Not done: 43%

Bolus:



<1hr: 66%
1hr-4hr: 2%
Not given: 32%
(SBP>90mmhg)



Antibiotics:
<1hr: 46%
1hr-4hr: 21%
Not given: 33%

I/O Chart:



Yes: 64%
No: 36%

Conclusion:-

From the above study period of 1 year, 132 patients were suspected to have sepsis.

Among all the patients, 66% of patients received iv crystalloid bolus within 1 hour of ED arrival , 32% patients maintained adequate peripheral perfusion with systolic BP>90mmhg and fluid bolus was not given.

49% patients had their blood cultures got sent within 1 hour, in 43% patients blood cultures were not sent.

In 23% patients, lactates were sent within 1 hour and 76% patients lactate levels were not checked.

46% of patients received IV antibiotics within 1 hour, 21% within 4 hours, 33% patients were not given antibiotics.

Recommendations:-

All EDs should have a sepsis lead and a sepsis protocol.

Education and training around these for wider team for early recognition and instigation of optimal care.

Serum lactate has been attributed to anaerobic metabolism secondary to tissue hypoperfusion , it also accumulates due to changes from aerobic metabolism occurring due to widespread inflammation.

Serum lactate levels provide excellent prognostic data in those with sepsis and helps calculate lactate clearance.

We would recommend this checklist to improve early detection and management of sepsis:

Sepsis 1 hour bundle:

COMPONENTS	YES	NO
IV CRYSTALLOID BOLUS (30ML/KG)		
BLOOD CULTURES		
SERUM LACTATE		
IV ANTIBIOTICS		
URINE OUTPUT MEASURED		

We thank our Head of Department Dr.INDRANEEL DASGUPTA for encouraging and supporting us throughout the audit.

We would also like to thank the Quality department and the Medical Record department who helped us with the data collection.