

# FUTURISTIC BIOTECHNOLOGY

<https://fbtjournal.com/index.php/fbt>

Volume 1, Issue 2 (July-Dec 2021)



## Original Article

## Septicemia in Patients Admitted at Mayo Hospital due to Wound Infection

Zoya Manzoor<sup>1</sup>, Muhammad Azhar<sup>2</sup> and Imrana Tanvir<sup>3</sup>

<sup>1</sup>Department of Pathology, King Edward Medical University, Lahore, Pakistan

<sup>2</sup>Ibadat International University, Islamabad, Pakistan

<sup>3</sup>King Abdul Aziz University, Jeddah, Saudi Arabia

### ARTICLE INFO

#### Key Words:

Septicemia, Wounds Infection, ALT, AST

#### How to Cite:

Manzoor, Z., Azhar, M., & Tanvir, I. (2021). Septicemia in Patients Admitted at Mayo Hospital due to Wound Infection: Septicemia in Patients due to Wound Infection. *Futuristic Biotechnology*, 1(02). <https://doi.org/10.54393/fbt.v1i02.25>

#### \*Corresponding Author:

Zoya Manzoor  
Department of Pathology, King Edward Medical University, Lahore, Pakistan  
[zoyamanzoorgcu@gmail.com](mailto:zoyamanzoorgcu@gmail.com)

Received Date: 29<sup>th</sup> September, 2021

Acceptance Date: 15<sup>th</sup> November, 2021

Published Date: 31<sup>st</sup> December, 2021

### ABSTRACT

Septicemia may result due to invasive procedures undertaken in medical sections. Patients are more likely to experience septicemia after endoscopic biliary drainage/stenting. **Objectives:** To find septicemia in patients admitted at Mayo hospital due to wound infection. **Method:** In a tertiary care hospital in Lahore, 101 confirmed cases of septicemia were the subject of an observational cross-sectional study. Any case of septicemia, whether it developed before or during a hospital stay, is included in the study. All patients' test results were collected between 24 hours of admission. Patients of both sexes were included, and their ages were broken down into three ranges: 30-50, 51-70, and 71-90. **Results:** Septicemia due to wound infection was seen in 8 patients out of which 5 were males and 3 were females. Bilirubin was high in 3/5 males but normal in 3/3 females. Blood glucose was high in 4/5 males and normal in 2/3 females. Blood urea was high in 4/5 males and 3/3 females. Creatinine was high in 7/8 patients. **Conclusion:** Major causes of septicemia were wound infection. Septicemia due to wound infection was seen in majority of patients. ALT, AST and ALP was high while total protein was normal in septicemia due to wound infection

### INTRODUCTION

Septicemia may result due to invasive procedures undertaken in medical sections [1]. The incidence of septicemia and Perioperative Myocardial Infarction (PMI) were much higher in patients given Intra-aortic Balloon Pump (IABP) support during Open Heart Operation (OHO) [2]. Patients are more likely to experience septicemia after endoscopic biliary drainage/stenting [3]. In a study *Pasteurella dagmatis* peritonitis and septicemia was observed in a patient with cirrhosis [4]. Systemic inflammation and susceptibility to developing sepsis is commonly seen in Acute Liver Failure (ALF) and result in tissue damage and organ failure [5]. Organ failure is a major complication of septicemia. Respiratory failure, circulatory failure, failure of coagulation system and hepatic failure are generally observed [6]. Myocardial abscess and metastatic abscess in spleen is secondary to

staphylococcal septicemia [7]. Nosocomial septicemia usually results in liver failure [8], adult respiratory distress syndrome and multiple organ failure [9]. Liver injury is a common complication of septicemia [10]. Hepatic dysfunction and jaundice are traditionally viewed as late features of septicemia [11]. Septicemia is complicated by meningitis and extensive spinal cord injury and lead to ascending brain stem necrosis and death [12]. Lesions in the nervous system also occur [13]. Septicemia is susceptible in Acute Liver Failure (ALF) patients that results in tissue damage and organ failure [5]. Adult Respiratory Distress Syndrome (ARDS) is frequently associated with septicemia. ARDS frequently complicates all forms of septicemia and is usually preceded by shock and thrombocytopenia [14]. All adult patients who were admitted to The Aga Khan University Hospital in Karachi

with acute respiratory failure were examined as part of the study. Hypoxemia and hypercapnic respiratory failure were seen. The two most frequent underlying causes of acute respiratory failure were pneumonia and COPD exacerbation. The mortality rate for ARF is high. Mortality was observed to be independently linked with chronic renal failure, malignancy, hypokalemia, severe acidosis (pH 7.25), septicemia, and ARDS [15]. septicemia in patients with wound infections who had been admitted to Mayo Clinic.

## METHODS

At the medical wards, intensive care unit, and accident and emergency department of Mayo Hospital Lahore, Pakistan, a cross-sectional, observational, and descriptive study was carried out. There were 101 clinically determined instances in both sexes. Children, pregnant women, and women nursing infants were not allowed to participate in the study. Individuals over the age of 30 were enrolled. These individuals have had in-depth examinations to identify the origin and etiology of the disease at the time of presentation. The patients' or their guardians' permission was obtained. Throughout the data collection procedure, every other ethical concern was taken into account. Also, the KEMU Ethical Consideration board gave their approval. Data was entered into a Performa created specifically for this use. Liver function tests, renal function tests, and full blood counts were performed on each patient. Latest SPSS version was used for data analysis.

## RESULTS

Septicemia due to wound infection was seen in 8 patients out of which 5 were males and 3 were females (Table 1-3). Bilirubin was high in 3/5 males but normal in 3/3 females. Blood glucose was high in 4/5 males and normal in 2/3 females. Blood urea was high in 4/5 males and 3/3 females. Creatinine was high in 7/8 patients. Na<sup>+</sup> was low in 3/5 males and 2/3 females. K<sup>+</sup> was normal in all patients (Table 1).

Gender	Bilirubin			B. Glucose			B. Urea			Creatinine			Na <sup>+</sup>			K <sup>+</sup>			Total
	L	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L	N	H	
Males	0	2	3	0	1	4	0	1	4	0	1	4	3	2	0	0	5	0	5
Females	0	3	0	0	2	1	0	0	3	0	0	3	2	1	0	0	3	0	3
Total	0	5	3	0	3	5	0	1	7	0	1	7	5	3	0	0	8	0	8

**Table 1:** Gender wise variations in RFTs in patients having septicemia due to Wound Infection

ALT was high in 4/5 males and was normal in 2/3 females. AST was high in 4/5 males and 2/3 females. ALP was high and total protein was normal in all males and females. Albumin was low in 4/5 males and was normal in 3/3 females (Table 2).

Gender	ALT			AST			ALP			T. Protein			Albumin			Total
	L	N	H	L	N	H	L	N	H	L	N	H	L	N	H	
Males	0	1	4	0	1	4	0	0	5	0	5	0	4	1	0	5
Females	0	2	1	0	1	2	0	0	3	0	3	0	0	3	0	3
Total	0	3	5	0	2	6	0	0	8	0	8	0	4	4	0	8

**Table 2:** Gender wise variations in LFTs in patients having septicemia due to Wound Infection

WBCs were high in all males in 2/3 females. Platelets were normal in 3/5 males and 2/3 females. Hemoglobin was low in 4/5 males and 2/3 females (Table 3).

Gender	WBC			Platelets			Hemoglobin			Total
	L	N	H	L	N	H	L	N	H	
Males	0	0	5	2	3	0	4	1	0	5
Females	0	1	2	1	2	0	2	1	0	3
Total	0	1	7	3	5	0	6	2	0	8

**Table 3:** Gender wise variations in CBC in patients having septicemia due to Wound Infection

Bilirubin was normal in 62.5% (5/8). It had no association with gender and age. Glucose was high in 62.5% (5/8). Urea was high in 87.5% (7/8). Creatinine was high in 87.5% (7/8). Na was low in 62.5% (5/8) and high in 37.5% (3/8). It had no association with age and gender. K was normal in 100%. It had no association with age and gender. ALT was high in 62.5% (5/8) patients and normal in 37.5% (3/8). It had no association gender wise. AST was high in 75% (6/8) and normal in 25% (2/8). It had no association gender wise. ALP

was raised in 100% males and females. It had no association gender wise. ALB was normal in 50%, low in 50% and high in 0%. It had no association gender wise. Total protein was normal in 100% males and females. WBC was high in 87.5% (7/8). It had no association with age and gender. Platelets were normal in 62.5% (5/8) and low in 37.5% (3/8). It had no association with age and gender. HB was low in 75% (6/8).

## DISCUSSION

Children frequently suffer from septicemia, a symptomatic bacteremia with a high morbidity and mortality rate. Septicemia in children typically manifests as a fever, wheezing, tachycardia, malaise, refusal to eat, or lethargic behavior. It is an urgent medical situation that calls for sensible antibiotic treatment. The isolation of a bacterial agent from a blood culture is the gold standard for the diagnosis of septicemia. Previous studies conducted in

Nigeria have revealed newborn blood culture positive rates of 25 to 55%. Neonatal septicemia therapy in Nigeria has a dismal track record, with rates of death ranging from 33 to 41% from the country's two tertiary institutions [16, 17]. In this study Septicemia due to wound infection was seen in 8 patients out of which 5 were males and 3 were females. Bilirubin was high in 3/5 males but normal in 3/3 females. Blood glucose was high in 4/5 males and normal in 2/3 females. Blood urea was high in 4/5 males and 3/3 females. Creatinine was high in 7/8 patients. Na<sup>+</sup> was low in 3/5 males and 2/3 females. K<sup>+</sup> was normal in all patients. A major portion of morbidity is caused by chronic wound infections, which can greatly raise healthcare costs. Initially, wound infection may seem as bacterial colonization; however, real infection may not develop until colonization is coupled with additional variables, such as reduced vascular supply, intrinsic pathogenicity of particular bacteria (such as *Staphylococcus aureus*), and host immunological responses. Chronic wound microbiology is intricate, making it challenging to identify the responsible microorganisms. It could be necessary to take quantitative or deep cultures of the wound tissue. In some circumstances, such as when specific mycobacteria are present, the isolation of particular organisms proves causation. The use of a combination of topical and systemic antiseptics to treat these wounds empirically is often appropriate [18, 19]. The majority of practitioners significantly rely on clinical criteria for the diagnosis of wound infection, according to a survey of wound care professionals in the USA. They used these findings 98% of the time, with patient-reported symptoms coming in second (88%) and wound culturing third (70%) respectively. Because the traditional clinical indications of infection are frequently absent in chronic wounds, identifying local infection can be difficult. Heat, redness, discomfort, swelling, and exudate may all be missing or barely present [20].

## CONCLUSIONS

Major causes of septicemia were wound infection. Septicemia due to wound infection was seen in majority of patients. ALT, AST and ALP was high while total protein was normal in septicemia due to wound infection.

## Conflicts of Interest

The authors declare no conflict of interest

## Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

## REFERENCES

- [1] Man A, Mare A, Székely E, Toma F, Lorinczi L. Bacterial etiology of the conditions associated with bacteremia/septicemia during the years 2006-2007. *Bacteriologia, Virusologia, Parazitologia, Epidemiologia* (Bucharest, Romania: 1990). 2008 Jan; 53(1): 25-30.
- [2] Aksnes J, Abdelnoor M, Berge V, Fjeld NB. Risk factors of septicemia and perioperative myocardial infarction in a cohort of patients supported with intra-aortic balloon pump (IABP) in the course of open heart surgery. *European journal of cardiothoracic surgery*. 1993 Mar; 7(3): 153-7. doi: [10.1016/1010-7940\(93\)90039-E](https://doi.org/10.1016/1010-7940(93)90039-E)
- [3] Motte S, Deviere J, Dumonceau JM, Serruys E, Thys JP, Cremer M. Risk factors for septicemia following endoscopic biliary stenting. *Gastroenterology*. 1991 Nov; 101(5): 1374-81. doi: [10.1016/0016-5085\(91\)90091-X](https://doi.org/10.1016/0016-5085(91)90091-X)
- [4] Ashley BD, Noone M, Dwarakanath AD, Malnick H. Fatal *Pasteurella dagmatis* peritonitis and septicaemia in a patient with cirrhosis: a case report and review of the literature. *Journal of clinical pathology*. 2004 Feb; 57(2): 210-2. doi: [10.1136/jcp.2003.7419](https://doi.org/10.1136/jcp.2003.7419)
- [5] Taylor NJ, Nishtala A, Manakkat Vijay GK, Abeles RD, Auzinger G, Bernal W, et al. Circulating neutrophil dysfunction in acute liver failure. *Hepatology*. 2013 Mar; 57(3): 1142-52. doi: [10.1002/hep.26102](https://doi.org/10.1002/hep.26102)
- [6] Frost L, Pedersen RS, Hansen HE. Prognosis in septicemia complicated by acute renal failure requiring dialysis. *Scandinavian journal of urology and nephrology*. 1991 Jan; 25(4): 307-10. doi: [10.3109/00365599109024565](https://doi.org/10.3109/00365599109024565)
- [7] Jariwala P, Punjani A, Mirza S, Harikishan B, Madhwar DB. Myocardial abscess secondary to staphylococcal septicemia: diagnosis with 3D echocardiography. *Indian heart journal*. 2013 Jan; 65(1): 124-5. doi: [10.1016/j.ihj.2012.12.005](https://doi.org/10.1016/j.ihj.2012.12.005)
- [8] He WP, Wang HF, Su HB. Clinical analysis of 77 liver failure patients with nosocomially infected septicemia. *Chinese Journal of Experimental and Clinical Virology*. 2004; 287-8.
- [9] Nieuwenhuijzen GA, Haskel Y, Lu Q, Berg RD, van Rooijen N, Goris RJ, et al. Macrophage elimination increases bacterial translocation and gut-origin septicemia but attenuates symptoms and mortality rate in a model of systemic inflammation. *Annals of surgery*. 1993 Dec; 218(6): 791. doi: [10.1097/00000658-199312000-00014](https://doi.org/10.1097/00000658-199312000-00014)
- [10] Kobashi H, Toshimori J, Yamamoto K. Sepsis-associated liver injury: incidence, classification and the clinical significance. *Hepatology Research*. 2013 Mar; 43(3): 255-66. doi: [10.1111/j.1872-034X.2012.01069.x](https://doi.org/10.1111/j.1872-034X.2012.01069.x)
- [11] Recknagel P, Gonnert FA, Westermann M, Lambeck S,

- Lupp A, Rudiger A, et al. Liver dysfunction and phosphatidylinositol-3-kinase signalling in early sepsis: experimental studies in rodent models of peritonitis. *PLoS medicine*. 2012 Nov; 9(11): e1001338. doi: [10.1371/journal.pmed.1001338](https://doi.org/10.1371/journal.pmed.1001338)
- [12] De Schryver N, Cosnard G, Van Pesch V, Godfraind C, Hantson P. Extensive spinal cord injury following *Staphylococcus aureus* septicemia and meningitis. *Case Reports in Neurology*. 2011; 3(2): 147-53. doi: [10.1159/000329841](https://doi.org/10.1159/000329841)
- [13] Svanbom M. A Prospective Study on Septicemia: II. Clinical Manifestations and Complications, Results of Antimicrobial Treatment and Report of a Follow-up Study. *Scandinavian Journal of Infectious Diseases*. 1980 Sep; 12(3): 189-206. doi: [10.3109/inf.1980.12.issue-3.06](https://doi.org/10.3109/inf.1980.12.issue-3.06)
- [14] Fein AM, Lippmann M, Holtzman H, Eliraz A, Goldberg SK. The risk factors, incidence, and prognosis of ARDS following septicemia. *Chest*. 1983 Jan; 83(1): 40-2. doi: [10.1378/chest.83.1.40](https://doi.org/10.1378/chest.83.1.40)
- [15] Hussain SF, Irfan M, Naqi YS, Islam M, Akhtar W. Acute respiratory failure in Pakistani patients: risk factors associated with mortality. *Journal of the College of Physicians and Surgeons—Pakistan: JCPSP*. 2006 Apr; 16(4): 287-90.
- [16] Adeleke SI and Belonwu RO. Bacterial isolates in neonatal septicemia in Kano, Nigeria (2002-2003). *Pinnacle International Journal of Medical Science*. 2006; 1(1): 17-20.
- [17] Meremikwu MM, Nwachukwu CE, Asuquo AE, Okebe JU, Utsalo SJ. Bacterial isolates from blood cultures of children with suspected septicaemia in Calabar, Nigeria. *BMC infectious diseases*. 2005 Dec; 5: 1-4. doi: [10.1186/1471-2334-5-110](https://doi.org/10.1186/1471-2334-5-110)
- [18] Nwadioha SI, Nwokedi EO, Kashibu E, Odimayo MS, Okwori EE. A review of bacterial isolates in blood cultures of children with suspected septicemia in a Nigerian tertiary Hospital. *African Journal of Microbiology Research*. 2010 Feb; 4(4): 222-5.
- [19] Siddiqui AR, Bernstein JM. Chronic wound infection: facts and controversies. *Clinics in dermatology*. 2010 Sep; 28(5): 519-26. doi: [10.1016/j.clindermatol.2010.03.009](https://doi.org/10.1016/j.clindermatol.2010.03.009)
- [20] Bamberg R, Sullivan PK, Conner-Kerr T. Diagnosis of wound infections: current culturing practices of US wound care professionals. *Wounds—a compendium of clinical research and practice*. 2002 Nov; 14(9): 314-28.