
Infectious Diseases and Sepsis /Septic Shock: An Illness in the African American Communities

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Abstract

Sepsis and septic shock cause considerable morbidity and mortality in the African American community, leading to higher mortality rates and increased hospitalizations. This paper analyses their impact and identifies factors that may help reduce their incidence among African Americans.

Keywords: Infections, Bacterium, Impairing Organ Functions, SIRS-Systemic Inflammatory Response Syndrome, SOFA-Sequential Organ Failure Assessment.

Introduction

The paper is an ongoing discussion concerning infectious diseases called sepsis, severe sepsis, and septic shock. Although, I am not a medical doctor, I am, however, an advocate for positive outcomes for Black families dealing with sepsis. One purpose of this paper is to add to the growing body of literature concerning sepsis, severe sepsis, septic shock and help improve positive outcomes of infectious diseases and the African American Community.

The story of Franchot Karl and Sepsis

One example of a Black Family dealing with sepsis is the story of Franc hot Karl. Franchot Karl recalled witnessing his mother unable to urinate and blood clots began to manifest within her body, The following statement illustrates Franc hot Karl's mother condition:

In the early part of 2012, mama had a blood clot surgically removed from the femoral artery. She seemed to recover well, but her incision leaks nonstop. Soon she complained of extreme weakness, had sporadic fevers and could not urinate. It wasn't long before she was fighting for her life in a city hospital.

After one week of hospitalization, a large grotesque abscess was found on her left groin. Incision and drainage were done; it was all that was done. At mama's death on May 9, 2012, her left groin, lower left torso and thigh were eaten away. Her underlying flesh and muscle were exposed. It was a

brutal death for such a beautiful person (Center for Disease Control and Prevention, 2014) [5].

This paper investigates the underlying causes of racial disparities in sepsis and septic shock outcomes among African American patients. Kalyan Chaliki et al. (2026) examined a cohort of sepsis and septic shock patients from 2013 to 2017, utilizing a pre- and post-implementation analysis called Severe Sepsis and Septic Shock Management Bundle (SEP-1), a protocol designed to accelerate sepsis treatment. Findings from one (SEP-1) protocol indicated that African American patients experienced longer hospital stays and higher mortality rates compared to white patients. One variable that has been shown to contribute to higher mortality rate among African Americans was health care professionals administering very low amounts of tests involving glomerular filtration rate, organ failure, or pulse oximetry. Despite the enforcement of (SEP-1) guidelines, the outcomes of sepsis/septic shock patients from this group remained statistically significant.

According to Van der Flier et al. (2013) [1] sepsis is defined as a systemic inflammatory syndrome response to an infection. This inflammatory response has components of both a hyperactive immune response and an immunosuppressant effect. Severe sepsis characterized by signs of organ dysfunction, lung problems, difficulty breathing, low urine output, abnormal liver function, and changes in brain activity. Finally, septic shock, produces very low blood pressure levels in some patients and other serious medical problems.

The Problem

African Americans are among the highest ethnic groups affected by sepsis. For example, Mayr et al. (2010) [2] found that Black patients have higher hospitalization rates for sepsis and organ dysfunctions in many cases. Similarly, Black et al. (2023) [3] analysed data from a cohort study and discovered that Black patients had a higher mortality rate from septic shock than other groups, especially among those 45 years old and younger. One reason for this higher mortality rate was organ dysfunction. To clarify, Lippert (2023) [4] explained that “sepsis is a life-threatening syndrome of organ dysfunction caused by the body’s response to an inflammatory infection” (p. 2397). Given these findings, the research question addressed the underlying causes of racial disparities in sepsis/septic shock outcomes among African American patients. According to Karl (2014) [5], sepsis is shrouded in mystery due to poor medical outcomes like the deaths of many African American patients dealing with sepsis and septic shock.

The paper presents data dealing with infectious diseases and African American patients. The researcher uses data from existing academic/medical search engines that estimated trends of mortality rates of African American patients dealing with sepsis within urban communities. The researcher pools medical data and opinions from medical doctors and analyses differences between the causes of sepsis and septic shock and what may be done to slow down poor outcomes of African American patients. In addition, Data presented in the paper were used interchangeably to illustrate viewpoints on that specific topic.

Method Review Section

To ensure comprehensive coverage, I used various academic research engines, including Google Scholar, JSTOR, the National Institutes of Health, and other medical publications. The framework synthesizes all references by organizing them and enabling direct comparison of research methodologies to identify strengths and weaknesses. The data were identified through case study document analysis, a purposive approach, and secondary materials to answer the research question. The selection of data derived from journal articles, non-fiction books, and recorded interviews that documented patients' unique experiences with sepsis or septic shock. All data collected on sepsis patients (African Americans) were given equal weight through quantitative, qualitative, and mixed methods approaches to answer the research question. The following subtitles were used: Introduction, Story of Franchot of Karl and Sepsis, The Problem, Method Review Section, Review of Literature, Mixed Method Approach, Documents, Quantitative methods, Alternative Methods, Limitations, and Conclusions.

Review of Literature

The research question investigates one underlying cause of racial disparities in sepsis/septic shock outcomes among African American patients. The articles selected came from existing literature that discussed sepsis/septic shock. I systematically incorporated and categorized three themes from data that addressed research question and discussed alternatives strategies from the data that assists understanding research problem more comprehensibly. Lastly, I compared findings from themes concerning infectious diseases and sum up existing medical policies and practices dealing with sepsis and septic shock.

Mixed Methods Approach

For example, AL Khalaf et al. (2015) [6] noted in their quantitative study that mortality rates remain extremely high for patients during the first year after hospital release. The study also found that “mortality rates remain significant for patients one to five years after being discharged for chronic illness” (Al Khalaf et al., 2015, p.132). Additionally, about “one-third of survivors of severe sepsis and septic shock regained good functional status after discharge” (Al Khalaf, 2015, p.135).

The data collected by Al-Khalaf et al. (2015) had a few biases and weaknesses in data collection. For example, Khalaf et al. (2015) studied only patients from a Saudi Arabian hospital and did not include those from the United States or account for patients who were discharged and later readmitted. These methodological limitations may have affected their results and contributed to ambiguity in outcomes for sepsis and septic shock patients. In contrast, Kaur et al. (2014) [7] conducted a more comprehensive observational study of children aged 1 to 14 years, examining global mortality and morbidity rates in Pediatrics sepsis. Kaur et al., (2014) considered several factors including “time in PICU transfers, duration of time stays at PICU, and the review of multi-organ dysfunctions, all of which provide further insight on the predictors of outcomes of Pediatrics sepsis within a PICU setting” (p.439). Additionally, Bryce et al. (2005) [8] used data

from the World Health Organization and the Integrated Management of Childhood Illness (IMCI) strategy to assess children's health outcomes and survival rates. Their analysis indicated that, according to PICU patient records collected during admission, 80 percent of deaths among children aged four years and under were due to sepsis (Kaur et al., 2014, p. 437) [7].

Documents

Another point of discovery was by Dr. Miao (2013) and Dr. Hagar (2013) [9] examining molecules that stimulated septic shock. For example, Dr Hagar et al. (2013) and colleagues admitted that prior research has previously documented that a group of external sensors called toll-like receptors detects when a foreign agent or bad bacteria enter the body and causes harm to the human body. However, additional research identified another set of sensors called internal that act like a motion detector that signals the immune system for help. But, in some cases, both external and internal sensors may cause “more harm than good due to the immune system overreacting to a bacterial infection” (Hagar et al., 2013; Science Daily, 2013 [9]).

Quantitative Methods

Black et al. (2023) [3] studied African American patients and found that many from this group lived in predominantly minority regions. Minority communities have low-quality health care facilities, fewer medical doctors, and lower vaccine rates, which contributed significantly to higher rates of septic shock patients (p. 2404). Zhou et al. (2024) [10] reviewed 97 Cutaneous T-cell Lymphoma (CTCL) sepsis patients and 88 non-CTCL patients and found that older individuals and those with frequent readmissions were common. Linnander et al. (2022) [11] noted that factors such as antibiotic resistance, fewer referrals for follow-up appointments, lower access to primary care, chronic illness, and low vaccination rates all contribute to high mortality among African Americans (p. 3). Dombrovskiy et al. (2007) [12] also indicated that African Americans with preexisting conditions were at greater risk of being admitted to local hospitals as sepsis patients.

Research by Takahama et al. (2024) [12b] investigated sepsis from the perspective of cytokine storms. Measuring gene expression across tissues, Takahama et al. (2024) identified three specific cytokine pairs as causing the greatest damage to sepsis/septic shock patients. Their study generated the first organism-wide map of sepsis effects, revealing that non-lymphoid tissues returned to normal quicker than lymphoid tissues. This helps explain why survivors of sepsis may have “reduced future survival rates due to lingering immune system compromise” (Ayshford, 2024) [12d]; Delano & Ward, 2016) [12c]. Takahama et al. (2024) [12b] offered a new direction to current researchers, focusing therapeutic efforts on addressing cytokine storms throughout the body. This study filled in gaps dealing with severe sepsis patients from a different perspective and offered new guidelines in approaching sepsis/septic shock from a critical analysis.

Discussion Alternative methods

Naturopathic doctors contribute to the management of infectious diseases by supporting the medical community. While antibiotics targeting the molecule responsible for septic shock can help some patients, this method is not effective for everyone. Hagar et al. (2013) [9] showed that certain cells in the body detect and remove harmful intruders through the immune system. However, Montmollin et al. (2013) [14], examining outcomes of critically ill cancer patients with septic shock, discovered that quick admissions into hospitals were one key factor to their survival.

One reason for this point was the “speed and appropriateness of therapy being administered to patients in the first hour” of their admissions (p 35). Another helpful strategy for sepsis patients that may help in their recovery is the amount of vitamin D given to patients at the initial stage of their hospital stay. Rech et al. (2014) [15] examined a large cohort study of sepsis/septic shock patients between 2006 and 2011 and discovered that many patients were deficient in vitamin D levels. Low levels of Vitamin D3 are one indicator of a weakened immune system and a contributor to other diseases manifested within the human body. High levels of vitamin D3 are important because they are a fat-soluble vitamin that supports T cell proliferation, and its phenotype helps reduce the production of inflammatory cytokines within the body (p. 76).

Another helpful treatment for severe sepsis patients was vitamin C. Juneja et al. (2022) [16] examined high dosages of vitamin C being administered to sepsis/septic shock patients and found that vitamin C helped “reduce the inflammatory response in some patients and increased positive outcomes” in others (p 349). Using a combination of high doses of intravenous Vitamin C at the 50mg level, thiamine 200mg, and hydrocortisone 200mg may be helpful to alleviate some symptoms in sepsis patients. Juneja et al (2022) [16], however, pointed out that this strategy was not a cure for sepsis/ septic shock, but rather one tool that may help alleviate some symptoms within infectious disease patients.

Limitations

The contrast in findings across these studies highlights the complexity of sepsis treatment and points to important limitations that may affect interpretation. While Juneja et al. (2022) [16] and Marik et al. (2017) [18] observed positive effects using alternative interventions, Lyu et al. (2022) [17], with a much larger sample size and randomized controlled design, found no significant benefit for such interventions. Differences in sample size, study design, patient populations, and the specific interventions used may account for the divergent outcomes. Larger studies like Lyu et al. (2022) [17] may offer greater statistical power but could be influenced by heterogeneity among patients, while smaller studies such as Marik et al. (2017) [18] may be more susceptible to bias but can provide valuable exploratory data. These conflicting results point to an ongoing need for rigorous, well-designed, and adequately powered studies to clarify which patients, if any, benefit from these alternative sepsis treatments. Continued scholarly

investigation and open dialogue between the medical community and patients are essential for advancing understanding and improving outcomes in the treatment of infectious diseases.

Conclusion

The paper attempts to increase dialogue concerning sepsis/septic shock and alternative supplements like vitamins C and D to combat sepsis. Lyu et al. (2022) [17] conducted a randomized controlled study with 428 subjects and a placebo group, but the findings were inconclusive. For example, among patients in the “intervention group, there was no significant difference between the two groups” in a 28-day period (Lyu et al., 2022) [17]. However, Marik et al. (2017) [18] studied 47 patients over a 7-month period, and Sepsis-Related Organ Failure Assessment scores decreased in all patients in the treatment group. All sepsis/septic shock patients are important and must be treated with respect. The literature review section illustrated viewpoints about sepsis and septic shock, increasing ambiguity about African American patients. However, one important point that should be highlighted about sepsis is that the illness is overwhelming to many individuals, causing large numbers of deaths. Sepsis/septic/ and severe shock have taken many lives and caused long recovery times for some individuals in regaining their mobility. Hagar et al. (2013) stated that clinical sepsis is complex in the medical field, and multiple inflammatory mediators may cause additional issues. But Hagar et al. (2013) data collection revealed additional pathways and guidelines for detecting hidden inflammatory responses. A goal of the paper was to highlight the limited amount of literature concerning African Americans and the illness called sepsis/septic shock and not provide a solution or answer to the dreaded infectious disease.

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