Sepsis-Induced Dessemination Intravascular Coagulation

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Presentation of Case/Process

A 72-year-old female arrives in the Emergency Department with complaints of the lower extremities, redness, and bleeding to her extremities. Upon physical assessment, patient was noted to have temperature of 300.1° F, HR 200, BP 90/70, apnea alert was WBC 14.2, lactic acid 4.16. Further testing revealed hemorrhagic 6/10 L/D) reticuloocytes (8.3%) and an increased INR (of 95). Platelet and decreased with platelet volume (MPV) of 12.3 fl, PT of 47 seconds and an APTT of 75 seconds. A reticulocytosis of 38%, D-dimer (8 ng/ml) indicating DIC secondary to sepsis. According to Falcao (2018) 250, 000 Americans die from sepsis every year and 1.5 million Americans get sepsis each year. Moreover, one in three patients who die in hospital has sepsis (p. 7).

Underlying pathophysiology

• Dissemination Intravascular Coagulation (DIC) is a result of a decreased fibrinolysis at the beginning of sepsis but as the infection spreads, there is a mark increased in fibrinolysis leading septic complications such as hemophagocytosis and DIC (Pangare, Zacchetti, Cressoni, Arzotelli, Bader, Gattinoni, 2013, p. 2). Sepsis Induced DIC is often caused by an infection that spread systemically. As a result, the immune system’s own defense mechanism is triggered resulting in “oxidative damage, hyper-inflammation, immune dysregulation, poor tissue oxygenation, and hyper-coagulation” (Falcao, 2018, p. 7).

• DIC can be acute or chronic. In acute DIC, there is a trigger in the immune system such as infection which can lead to serious hemorrhage. In chronic DIC, it is the exposure to tissue factor that cause DIC. Also, clot formation is common in chronic DIC which block small and medium vessels.

• Hypercoagulability of the immune response often caused Dissemination Intravascular Coagulation (DIC).

• Coagulation is a normal response of the body immune system to fight bacterial infections (Schub, Balderrama, 2018, p. 7). However, when the immune system failed to target pathogens, the uncontrollable inflammatory response can occur. This increased inflammatory response can cause failure of platelet and clotting factors.

• A reduction in platelet synthesis and clotting factors leading to DIC secondary to bleeding cascade. The most important inflammatory mediator in DIC is tumor necrosis factor (TNF-α), interleukins (IL-1, IL-6, IL-8, 2018, p. 18). Factor VII (a) pathway leads to TF and it is an important in coagulation disorder (Falcao, 2018, p. 18).

Signs and Symptoms

• “One of the first signs of DIC can be sticking or explicit bleeding. Bleeding from multiple sites (e.g., nose, gums, vagina, varicose veins, skin) around the body.”

• Sudden onset of bruising; hemorrhage; hematemesis, jaundice; severe muscle, back, and/or chest pain; tachycardia; hypotension; oliguria; ilegalia; signs of shock, but also any of the symptoms of DIC have results of DIC” (Schub, Balderrama, 2018, p. 2).

• In postoperative DIC, bleeding can occur in surgical sites and drains. Patients with low-grade DIC might be asymptomatic with abnormal coagulation study results” (Schub & Balderrama, 2018, p. 2).

Significant of Pathophysiology

• Early detection of DIC involves assessing laboratory parameters such as platelet count, prothrombin time, a fibrinogen level, and D-dimer. In an emergency setting the potential for DIC to potentially make the treatment of sepsis very challenging for healthcare provider (Grec, Lupia, Vitoz, & Montrucchio, 2017, p. 4).

• Recognizing patients at risk for extreme multorgan dysfunction and death may receive bleeding interventions when changes in coagulation parameters are recognized sooner (Schub & Balderrama, 2018, p. 2).

• The potential treatment of sepsis may vary as well as antithrombin inhibitor (inhibitor). According to my author, the anti-inflammation property of antithrombin inhibitor can reduce C-reactive protein and leukocytes-platelet aggregation which has been considered in the treatment of sepsis (Falcao, 2018, p. 38).

• There is no guarantee that this is an effective treatment but it is worth the consideration in severe sepsis.

• Early treatment of infection and antithrombin (PTM) administration were observed in two groups of participants. Sequential/Sequins/Opal/Arkell/Antithrombin (APM) group was significantly better in the effectiveness of treatment. The aim of this study was to investigate the relationship between early changes in antithrombin inhibition and DIC with bactericidal versus treatment with an anticoagulant. After analyzing the study, the result showed that anti-coagulation in the early stages, there was a poor outcome for these patients. (Mochizuki, Mor, Nakamura, Uchimoto, Kajim, Takahashi, Hara, 2016, p. 335).

From the above presentation, it is clear that Sepsis Induced DIC is a life-threatening condition that can lead to mortality and morbidity. Early recognition and treatment of sepsis is important to prevent complications such as DIC. 75% of sepsis cases are further complicated by DIC (Okamoto, Tamara & Sawatsubashi, 2016).

Conclusion

Implications of Nursing Care

• Implication of nursing care may include educating patients and family members that DIC is a serious and highly complicated condition that needs close observation and close in ICU.

• Educating patients and family members to report the any sign of bleeding e.g., around I.V. insertion site, difficulty breathing, change in mental status (Schub & Balderrama, 2018, p. 2).

• The nurse also play a key role in the psychological and emotional support of patient who is admitted for severe sepsis and or septic shock. The nurse need to observe patients closely for signs and symptoms of airway hemorrhage.

References


