CONFERENCE ABSTRACT BOOK OPEN ACCESS

The Surgical Journal x Youth Pioneers in STEM International Youth Medical Conference

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Abstract
The Surgical Journal x Youth Pioneers in STEM International Youth Medical Conference is a two day, virtual conference for high school students, pre-meds, and medical students around the world organised by The Surgical Journal and Youth Pioneers in STEM. 100 participants internationally attended the workshop on ‘’Introduction to Clinical Research’’ by our keynote speakers which was followed by a case diagnosis competition during which students are given the opportunity to analyze, research, hypothesize, and determine the correct diagnosis, exactly like a doctor would! Abstracts in this booklet are provided by the top 5 teams nominated by our panel of judges.

Keywords: The Surgical Journal; Youth Pioneers in STEM; Youth Medical Conference; Case Diagnosis Competition; high school and undergraduate; sickle cell anemia

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Conference Abstracts

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Case Diagnosis Competition Abstracts

Interventions against sickle cell anemia and streptococcus pneumoniae induced community-acquired pneumonia (CAP): A literature review

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Introduction: Sickle cell anemia (SCA) is an inherited blood disorder caused by the mutated HBB gene inducing the production of sickle hemoglobin that obstruct blood vessels and limit the circulation of healthy oxygen-carrying cells resulting in anemia and organ damage causing pain crises. Patients who suffer from SCA fall at risk of community- acquired pneumonia (CAP).
Methods: Literature review was performed to summarize research on different effective therapeutic options for sickle cell anemia & S. pneumoniae induced CAP.
Results: Various interventions had their efficacy listed with information gained from various studies. The main “efficacy” focuses were hemoglobin values, VOE frequencies & other statistical measurements.
Discussion: This literature review provides insight into emerging treatments & interventions for SCA and S. pneumoniae induced CAP and acknowledges that only majorly emerging and effective promising treatments were included. Some interventions are undergoing clinical trials with animal subjects, making it difficult to assure that human subjects will

experience same levels of effectiveness associated with the intervention. Evidence largely supports the anticipated effectiveness on human patients.
Conclusion: Treatment options for SCA & S.pneumoniae induced CAP may be affected by geographical region, different sensitivities & resistance levels affected by antibiotic prescription behavior in varying regions, past medical history of patient, and severity of illness.

Primary treatments for patients with sickle cell anemia: A research study
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Introduction: Sickle Cell anemia is an autosomal recessive congenital disease. Treatment of sickle cell anemia is usually aimed at avoiding pain episodes, relieving symptoms and preventing complications. An analysis is conducted pertaining to the specific case study.
Methods: A research study was performed to discuss the different treatment methods for Sickle Cell anemia
Results: Different treatments all varying efficacy shown along with important information regarding the specific treatments. This focused on the effectiveness of the treatment to reduce the impact of this genetic disease and longevity.
Discussion: This research study gave insight into the many treatment methods for Sickle Cell anemia, but explained how a direct treatment comparison is not possible because of the different cases, symptoms and severity of the disease. Multiple treatments are used in combination with another resulting in difficulty in determining which individual treatment is best.
Conclusion: The treatment for this disease is dependent on the scenario and case, as it changes the severity. The patients age and overall health are other factors that need to be considered when deciding the ideal treatment plan.

Treatment options for sickle cell anemia and sickle cell anemia induced pneumonia
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Introduction: Sickle Cell Disease (SCD) is a hereditary red blood cell disorder often leading to severe complications including pneumonia, stroke, and multiorgan failure. People affected by SCD have shortened life spans (42-47), while experiencing severe “crisis” pain due to blood vessel blockage and anemia, which encourage researchers to discover methods to prevent blood cells from sickling (taking a “C” shape rather than the normal circular form) to alleviate pain and infection rates. As a general statement bone marrow and stem cell transplantations are the only cure for SCD, this is a general statement as this treatment is only implemented in severe cases, causing moderate cases to be addressed through less risky treatment options. Common drug targeted therapies include erythropoietin, corticosteroids, hydroxyurea, voxelotor, l-glutamine oral powder, and crizanlizumab, which serve to limit discomfort while re-establishing bodily homeostasis. Modernized approaches include gene therapy, HSCT, and developing CRISPR techniques. A more social approach includes genetic counseling.
Methods: A literature review was conducted in order to summarize all available research on SCD treatment options, including medication, therapies, and surgical interventions, through analysis of individual SCD studies as well as existing treatment method studies as a whole. The studies concerned SCD patients of all ages and SCD patients with side conditions like ACS
Results: All treatments listed had desirable results, mostly improving quality of life for patients, prolonging lifespan, while simultaneously reducing pain.
Discussion: The literature review provided insight into the current treatment options of SCD and SCD linked pneumonia, while showing that direct comparison between treatment types would yield inaccurate and unreasonable results. These medications and treatment plans are often used in combination making it difficult to attribute the result of a single medication.
Conclusion: Treatment options of SCD and SCD linked Pneumonia is affected by the unique severity of symptoms (like pain), combination of experienced symptoms, side conditions and newly developed conditions and infections, and patient history. The review helps summarize the nature of SCD and the current approved and prevailing treatment options, including medication, therapies, and surgical procedures.

Diagnosis and treatment of sickle cell disease: A literature review

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Introduction: Sickle Cell Disease (SCD) is a rare but manageable blood disorder. The severe pain and anemia accompanying the disease have led to extensive research on treatment and management options for SCD patients. One such patient was a 14-year-old female who presented with dyspnea, dactylitis, pallor, dark urine, pneumonia, and a fever. Upon physical examination, she was found to have a 101-degree temperature and scleral icterus. A CBC indicated an elevated level of leukocytes and reticulocytes and decreased hematocrit and hemoglobin; an ultrasound confirmed hepatomegaly and splenomegaly; a peripheral smear indicated sickle cells. The patient was diagnosed with SCD. Treatment options include Bone Marrow Transplant, Hydroxyurea, and Oxbryta.
Methods: A literature review was conducted to review all research pertaining to the management and treatment of SCD.
Results: Numerous treatments were investigated and their efficacy and side effects were listed.
Discussion: This literature review covered the primary treatment options for SCD and recognized that these treatments could not be specifically compared. Various treatments may be utilized on a patient-by-patient basis.
Conclusion: Treatment and management options for SCD depend on the patient. Bone marrow transplants remain the only cure, but numerous other therapies are advised to manage the patient's symptoms.

Treatment of sickle cell anemia: A literature review

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Introduction: Sickle Cell Disease is an inherited disorder that causes red blood cells to be crescent or sickle-shaped. The survival rate for sickle cell varies between patients, but the median lifespan ranges between 42 and 48 years old. The majority of infected patients are among the African American population. Standard procedures and treatments are discussed to alleviate symptoms, while bone marrow transplant has been the only cure for SCD. Different combinations and treatment approaches should be evaluated depending on each patient's condition and severity. Common oral medications include L-glutamine and hydroxyurea. Bone marrow transplant and chemotherapy approaches vary.
Methods: A literature review was performed to summarize all available research on the different categories and types of therapeutic options for SCD. The only cure for sickle cell disease, which is a bone marrow transplant, has shown to be 85% successful. There are also many methods of alleviating the symptoms of this disease, such as through medicine and lifestyle changes.
Results: While methods of treatment other than bone marrow transplant will not abolish sickle cell disease, medications, counseling, and healthy lifestyle practice can allow a patient to live a full life. It is important to make smart choices and consult with a hematologist regularly.
Discussion: The survival rate varies for each individual and differs on treatment and how certain medications react in a patient's body/ how infections respond to treatment, and the lifestyle the patient maintains.
Conclusions: In the future, it would be beneficial if hydroxyurea treatment was prescribed more frequently, as it ameliorates younger SCD patients, averting the body from complications and lesions. There should be more future research on other treatments and preventions, as the only the current cure is bone marrow transplant which may result in other complications.

Conflicts of Interest

The authors declare that they have no conflict of interests.

Authors' Contributions

RS: Founder and Chair of TSJ x YPSTEM Youth Medical Conference, served as a planning committee for the conference, drafted the conference abstract booklet, reviewed the abstract submissions and ensured that they adhered to correct formatting standards, and gave final approval of the version to be published.
LE: Co-Chair of TSJ x YPSTEM Youth Medical Conference, served as a planning committee for the conference, assisted authors with their abstract submissions, and gave final approval of the version to be published.
MF: served as a planning committee for the conference, drafted the conference abstract booklet, reviewed the abstract submissions and ensured that they adhered to correct formatting standards, and gave final approval of the version to be published.

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