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Challenges of Blood Transfusions in β-Thalassemia during COVID-19 Pandemic in Low Middle-Income Country

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ABSTRACT

AWuhan, Hubei province, China, was recognized as the center of an epidemic of pneumonia of unknown origin in December 2019. Ultimately, intense focus on the disease was raised in China and globally. Consequently, on January 7, 2020, Chinese research scientists identified the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in an affected patient in Wuhan. Several members of this family circulate in humans, causing a wide range of disease conditions ranging from mild to life-threatening Beta thalassemia is a congenital hereditary disorder of inefficient erythropoiesis that leads to peripheral red cell breakdown due to defective β-globin series. The severity of the disease depends on multiple genetic and environmental factors. Individuals with beta-thalassemia are classified based on their transfusion demands as having transfusion-dependent thalassemia (TDT) or non-transfusion-dependent thalassemia (NTDT). Routine transfusion remains the recommended standard management for beta-thalassemia, as it efficiently controls the thalassemia symptoms. If left untreated, Beta thalassemia major (BTM) can eventually induce spleen enlargement, deformation of bone due to bone marrow growth, and heart failure due to severe anemia.

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Introduction

In China Hubei province, Wuhan was recognized as the focus of an epidemic of pneumonia of unidentified origin in December 2019. Ultimately, intense focus on the disease was raised worldwide and in China. as a result, on January 7, 2020, Chinese research scientists identified the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in an affected patient in Wuhan. Beta thalassemia is a congenital hereditary disorder of inefficient erythropoiesis that leads to peripheral red cell breakdown due to defective β-globin series (1,2). The severity of the disease depends on multiple genetic and environmental factors. Individuals with beta-thalassemia are classified based on their transfusion demands as having transfusion-dependent thalassemia (TDT) or non-transfusion-dependent thalassemia (NTDT). Routine transfusion remains the recommended standard management for beta-thalassemia, as it efficiently controls the thalassemia symptoms. If left untreated, Beta thalassemia major (BTM) can eventually induce spleen enlargement, deformation of bone because of bone marrow growth, and heart failure as a result of severe anemia (3-6).

Demand and supply in low-middle-income countries

Each year, over 22,500 deaths worldwide occur due to patients' not receiving sufficient transfusions (7). A survey analysis reported by the World Health Organization

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documented the ratio of patients receiving blood transfusions with TDT was lower than 3% in the Western Pacific region and Africa but was 52.4% in the USA. As a result of blood shortages and expensive expenses, individuals with TDT in low-middle-income countries generally receive insufficient transfusions and have lower-than-recommended hemoglobin levels (8-10). The causes for insufficient supplies of blood include unawareness of a rational reporting system, nonregistered blood collections, and transfusions in illegal sectors. Moreover, currently, developed nations are also suffering from inadequate blood supplies. Whole blood donations were reduced to 18% in 2015 in Northeastern Germany (10).

Ethnicity of patients with BTM in Pakistan

BTM is recognized as a serious health problem among the public of Pakistan, where more than 5000 new cases of BTM have been identified annually. Among the 182 million individuals in Pakistan, Punjabi (53.5%), Pashtun (Pathan; 15%), Sindhi (14%), Muhajirs (7.5%), Balochi (3.5%), and others (6.5%) are the six major ethnicities (7). In this state, Karachi is the metropolitan city where most of the blood transfusion facilities are available, and patients from all over Sindh received a blood transfusion in Karachi.

In the region of South Asia, a 38 percent zonal shortage in supplies of blood has been documented. In South Asia, seven countries have local blood protocols; however, in Pakistan, which battles to preserve sufficient supplies of blood, almost 75% of blood donations are arranged from replacement donors, while 15% were from paid donors and only 10% are provided by unpaid volunteers (11-13). However, due to the recent COVID-19 outbreak, donors are restricted from donating blood in hospitals due to the lockdown in the country. Moreover, there are not enough COVID-19 testing kits available to test every donor. As a result, BTM patients from interior Sindh and Baluchistan are severely affected by the COVID-19 pandemic situation.

Blood campaign

Subsequently, due to inadequate blood supplies, some facilities started door-to-door blood donation campaigns in order to overcome the shortages and to serve the BTM patients residing within the city. In light of the COVID-19 kit shortages, several facilities offering specialized blood transfusion services have begun to contact healthy volunteers with no history of recent travel for blood donation. Volunteers who agreed to donate blood were called for blood donation appointments without undergoing COVID-19 testing, and blood was taken under strict compliance with the current guidelines and transfused into BTM patients after screening for major elements.

Healthcare staff working at the premises of blood donation and other donors get infected by an infected donor who is symptomless or has mild symptoms. however, blood centers should strengthen the suspension or delaying of those individuals with an abroad travel history to an affected country of COVID-19 in the last fourteen days or those with known confirmed cases of COVID or those with close touch with a diagnosed COVID-19 case

In conclusion, due to the issues mentioned above, blood supply shortages have been observed, and BTM patients' dependent on blood transfusion are severely affected by Pakistan's recent lockdown enacted due to the COVID-19 pandemic.

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