

USAGE OF PLASMA PROTEINS AROUND THE WORLD

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The consumption of plasma products on a per capita basis varies greatly around the world, for numerous reasons. Still, there are commonalities among many places, and a clear trend toward greater usage is seen in most countries. This article focuses on the “core” three fractions: albumin, polyvalent immunoglobulin (IgG), and plasma-derived factor VIII, with emphasis on usage in China and other Asian countries.

Italy has the highest per capita albumin usage in the world with 684 grams per thousand inhabitants in 2014. Albumin is notably prescribed to cirrhotic patients, often monthly, with several units at a time. At the other end of the spectrum, countries such as India used only 19 grams per thousand people in 2015. In these countries, the lack of access to adequate health care, and the affordability of products, are key issues, compounded by lack of funding for plasma-derived drugs. China is close to the world’s average, with 232 grams per thousand inhabitants in 2016. This is higher than the United Kingdom and Switzerland, and not far below Germany. Given the population of China, this country is the largest albumin user in the world, representing roughly one-third global consumption, followed by the United States. However the indications for which albumin is prescribed differ somewhat in China and the United States. In the U.S., albumin is used primarily for cardiovascular surgery, sepsis/infections, and cirrhosis, in this order. In contrast, in China the top three indications of albumin are cancer (mostly lung and liver cancer), cirrhosis, and sepsis/infections, in this order.

In the past 12 years, albumin usage has grown

considerably, particularly in Asia: In China, albumin consumption increased 268 percent between 2003 and 2015 while usage jumped 370 percent in Indonesia and 198 percent in Malaysia. However albumin consumption only increased by 12 percent in Korea in 12 years, and in Japan, it decreased by 26 percent in that time. In Japan, the self-sufficiency policy restricted the market to only include the domestic manufacturers, constraining the albumin supply. In South Korea, the low price of albumin treatment has discouraged imported albumin, causing the market to grow slowly, as the supply was essentially from local recovered plasma.

Regarding IgG, the countries with the highest usage per capita are the United States, Australia, and Canada, each with more than 200 grams per thousand inhabitants. Many European countries report an average consumption ranging from 65 grams to 110 grams per thousand population, while the average usage levels in Asian countries are lower. For instance, the usage per capita in Indonesia is less than 1 gram per thousand inhabitants, and in China, 18. China uses much less IgG than European countries but more albumin, due to cultural and political reasons. Politically, the Chinese government embraces local manufacturing and sourcing policy for the supply of plasma-derived medicines but makes an exception for albumin, which may be imported from foreign companies. In contrast, IgG cannot be imported, and it is not as popular as albumin due to the cost and lower awareness. However IgG usage has increased significantly from 2003 to 2015 in China and several Asian countries: +317 percent in China, +286 percent in Indonesia—which started



level, and +151 percent in South Korea. In Japan the IgG consumption grew at a more modest 39 percent in 12 years or 2.8 percent per year because the self-sufficiency policy has restricted the supply, leading to lower consumption. IgG has been available in Japan since 1979, as in Europe and North America, and is prescribed for the same conditions as in Western countries: chronic inflammatory demyelinating polyneuropathy, primary immunodeficiency diseases, and chronic idiopathic thrombocytopenic purpura, as well as Kawasaki disease. In many emerging markets, IgG is mostly prescribed for acute conditions because the excessive cost of chronic treatment is beyond the means of patients and funding entities. In China, IgG is mainly used for serious bacterial infections, Kawasaki disease, and Guillain–Barré syndrome, all conditions that can be treated with only one or two infusions of IgG.

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With respect to factor VIII, Germany and the United States have the highest per capita consumption of plasma-derived and recombinant combined, at more than 9.0 international units (IU) per capita. Conversely, China has a very low average consumption of only 0.2 IU per capita (2016) because most domestic fractionators do not produce factor VIII and foreign plasma-derived factor cannot be imported. The Chinese government does allow the import of recombinant factor VIII products, but they cost more than plasma-derived products, limiting their usage to a minority of hemophilia A patients as there is no universal health insurance coverage in China. Consequently, prophylaxis is very low and many patients treating on demand do not have adequate access to coagulation factors. Given such low per capita usage, consumption in China has grown by an impressive rate of nearly 600 percent in the past 12 years, but much remains to be done to improve hemophilia care in the country. In other Asian countries, the consumption per capita of factor VIII has also grown significantly over the same time period, including Japan (+552 percent), South Korea (+254 percent), and Malaysia (+118 percent).

In almost all Asian countries, the consumption of the core plasma products (albumin, polyvalent Ig, and plasma-derived factor VIII) has consistently grown over the past 12 years. Exceptions are found in countries where strict self-sufficiency policies (Japan and South Korea) restricts patient access to the product. Still many differences exist between countries based on health care coverage, economic development, and government priorities, and much work remains to be done to close the gap. ●