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Review

Nurses perspective of apheresis in SARS-CoV-2 infected patients

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ABSTRACT

The COVID-19 pandemic had world wide an enormous impact on the complete global population and all daily activities. Not only in the work related situation, but also in the private. Fear to become infected, or infect third parties (family and other patients) is present, and in the same time organizing an apheresis unit country wide is a challenge.

Working as an apheresis nurse in a period with a lot of Covid-19 preventive actions was challenging. In this paper I will share experiences of my colleagues and myself in the past 2 years working in various hospitals and the national blood bank in the Netherlands (Sanquin Blood Supply). I will discuss the Covid-19 outbreak, difficulties and challenges we met, the collection of substantial numbers of Covid convalescent plasma units (CCPs) collected by Sanquin Blood Supply, how we treated patients and took precaution actions to avoid getting infected with the SARS-CoV-2 virus. Doing our job as a nurse in the best possible way. It's also about personal situations and the search for balance and the responsibilities. And in the end the benefits and improvements raised.

In our eyes, the profession of apheresis nurse is one of the so called critical professions. This is meaning that you can't stop performing apheresis procedures in patients. It is really important that patients requiring apheresis therapy get the procedure when needed. These patients often have a morbidity or mortality increasing symptom complex caused by for instance an autoimmune disease or cancer. The patient can be very sick and have a low immunity.

Therefore, for this treatment we can't take a break, meaning being available 24/7 including weekend and holidays.

There are many different apheresis procedures for adults and children, for example collection of red cells from patients with hemochromatosis or polycythemia vera. In the Netherlands, our team performs these procedures in various donor centers and in a number of hospitals. Secondly, we collect leukocytes for cellular therapies, e.g. monocytes, granulocytes, lymphocytes (CD3+ cells) and hematopoietic progenitor cells (CD34+ cells) from donors and / or patients. We perform plasma exchange procedures whether or not in combination with adsorption techniques in persons with autoimmune diseases for instance thrombotic thrombocytopenic purpura (TTP), and red cell exchange procedures in sickle cell disease patients.

In the Netherlands, Sanquin apheresis nurses work in routine in more than 20 different hospitals and sometimes as well as in the collection centers of the blood bank for the blood supply. The hospitals and collection centers are spread all over the country. Although the nurses work in specific regions in the country, to perform a therapeutic apheresis procedure in a specific hospital, they potentially have to travel large distances, sometimes between 200 and 300 kilometers. And this is 24/7 possible.

The Special Apheresis Team is composed of 22 trained nurses, 2 team leaders and a head of the department and is embedded into the Unit of Transfusion Medicine of Sanquin Blood Bank. It is a national team and together they perform every year 1500–2100 apheresis procedures.

1. The Covid outbreak

In January 2020 started the Covid-19 outbreak in Europe. It was the beginning of an uncertain time. The Prime Minister of the Netherlands was giving a speech and everybody was worried what could happen. In the news we heard that many persons in other countries became very sick and died. Most people were afraid getting infected by the Coronavirus and get Covid-19. The first advise was "if possible stay at home" and most of our friends and family did. They worked from home and the children received education while staying at home. They didn't visit the old- or vulnerable people anymore. Due to the lockdown, restaurants, bars and the majority of the shops were closed.

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The first problem in Covid time for us as nationally working apheresis nurses was that we were confronted with "virtual borders". Some hospitals demanded that only co-workers living in the same region as the hospital were allowed to work in a this hospital, because of variances in the prevalence of "Corona infections". This situation lead to challenging logistic problems because of the large distances between the teams and the hospitals in the Netherlands. We couldn't assist each other anymore. Between the various hospitals there were also different policies regarding quarantine or which personal protection materials should be applied. This was sometimes really confusing.

More complex that time was that our apheresis teams were vulnerable since they work in rather small teams with 5 or 6 nurses maximally. In various cases, a substantial percentage of the colleagues were sick themselves or came into close contact with diseased family members. Since there were at that moment no reliable self-tests and PCR wasn't widely available yet, they had to stay at home in quarantine as precaution. Colleagues lost family members because of Covid-19 and were not available for work for some period. It was extremely difficult to do your job but in the same time don't say "no" to the hospitals. We needed to be very flexible and did a lot of work in overtime. There was a big responsibility for all of us giving our patients their needed treatment on time. Patients, but also medical personnel in hospitals, were worried that their treatment got delayed.

Unfortunately, to buy some additional time for really sick persons, routine procedures in some patients had to be canceled in the Covid-19 period. For example, hemochromatosis patients in need of therapeutic erythrocyte reductions to lower their ferritin levels came less frequently for a reduction procedure since emergency procedures had priority.

Besides that, in April - May 2020, the Minister of Health of the Netherlands requested as soon as possible the collection of at least 30,000 kg of Corona Convalescent Plasma (CCP) for the production of virus specific immunoglobulins besides the thousands of units of CCP to be used as fresh frozen plasma. In the subsequent year, as many as 35.000 cured COVID-19 patients had signed up to donate antibodies by plasmapheresis. All together, a substantial number of donors donated in average four times 600–800 mL of plasma in a short period. In one year time, approximately 75,000 additional plasma donations were collected besides all other whole blood collections, plasma and plateletapheresis procedures. A limited number of the collected plasma units were distributed as COVID convalescent fresh frozen plasma to the hospitals, but the majority of the collected units of plasma were fractionated into hyperimmune immunoglobulin concentrates at a record time. The first batch of these anti-Corona rich immunoglobulins was available in October 2020. The apheresis collection of these additional kilos of plasma in the donor centers, together with the mandatory social distancing, had consequences for the availability for the treatment of our patients. In our situation, apheresis procedures in medically stabile patients are not only performed in the hospitals, but also in some of the collection centers. For patients, there was simply no collection bed available.

When persons tested positive for Covid-19 and hospitalization was needed, they were admitted to the Covid ward of the hospital. Some of them had, in addition to Covid-19, autoimmune diseases and were very sick. In case such a patient also needed apheresis therapy, the procedure was performed at this Covid ward. As an apheresis nurse you will sit next to the patient for hours and hours and it was important that everything you touched had to be cleaned and disinfected. Of course, we had to wear personal protection items. We couldn't eat or drink for hours and in case medical assistance was needed, we had to wait because there wasn't another nurse or physician for help nearby. We were worried of getting infected. There were no vaccinations available yet. Luckily, we had good personal protection materials and clothes available, but wearing all the additional personal protection material made all even more heavy for us.

We felt a big responsibility for our work as an apheresis nurse to treat the patients and for our team. But at the same time, we were terribly worried to infect the people we love because of our work and the contacts with people potentially infected with Corona. In the starting months of the Covid-19 pandemic, the most of my colleagues visited basically nobody. We were really afraid to infect our family, but also patients in the different hospitals as well. In the Netherlands, in the starting period of the Covid-19 pandemic, there were not sufficient FFP-2 masks available, there were also no reliable antigen tests and no vaccinations available. Working from home wasn't available for the apheresis nurses. Also social distancing of at least 1.5 m from our patients wasn't possible.

One of the colleagues in our team got Long-haul Covid and she wasn't able to work for several months. Because of the infection risks for our relations, we tried to avoid face-to-face contacts in our small team as much as possible. This was sometimes hard because physically you miss your colleagues for social contact and a quick consultation. But on the other hand, digital possibilities with virtual meetings became in use. We could meet in "TEAMS" for our monthly team meetings, follow online training and do our administration from home. This saved enormous travel time and travel costs.

In the first months, daily practise in the Covid-19 pandemic was sometimes difficult and we had a lot of challenges to overcome. Now in the end of 2022, there is more knowledge, there are vaccines and self-tests. Less Corona infected people are admitted to hospitals. My experience was that the COVID-19 pandemic period was sometimes difficult and we needed to be very flexible at our work and at home, but in the end we made it together.