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DEALING WITH THE UNEXPECTED IN EUROPE: THE CHALLENGE TO ENSURE SUFFICIENT QUANTITY OF SAFE BLOOD DURING THE WAR AND SIEGE OF SARAJEVO 1992-1995

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Abstract

A key principle that guides the work of every blood facility is that blood must wait for patients, not patients wait for blood. This principle was severely put to the test during the war and siege of Sarajevo, Bosnia and Herzegovina. At the onset of war the Blood Transfusion Institute in Sarajevo formulated a second principle. That its staff must take the risk of being injured not blood donors. As a result of our experience some recommendations are given for war/seige blood policy.

Post conflict 3 medium term strategies were developed. They focus on the motivation of blood donors, safe blood and the management of blood services. The strategies will contribute to achieving a long term perspective or vision that models blood services in Bosnia and Herzegovina on European laws, regulations, standards, best practices, and education and training.

Key words: *Blood supplies. War. Siege. Policy*

Introduction

Box 1. In the last decade of the 20th century

More than three years of war, siege and disruption of electricity and other utilities in Europe is a unique experiment in-vivo in modern day medicine.

Preplanning for the unexpected was always recommended in ex-Yugoslavia. But it was never imagined that in the last decade of the 20th century such preplanning would be put to the test because of war.

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A war that lasted not just for a few days or weeks but for nearly 4 years. In Sarajevo, with no water, gas or electricity the epidemiologists expected communicable disease epidemics. But the reality was different – there were no such epidemics. The overriding problems were death and disability due to war injuries.

Four years of bombardment, massacres and snipers resulted in about 11,000 civilians being killed of whom more than 1,500 were children less than 12 years of age. And about 60,000 civilians were injured.

During those 4 years more than 80,000 blood units were taken and given to the wounded during 60,000 operations undertaken at the University Clinical Centre Hospital. Of those needing an operation 10 per cent were in reversible oligemic shock. And 10 per cent needed more than 10 units of blood.

Guiding principles

Box 2. Two key principles in war

1. Blood must wait for patients, not patients wait for blood
2. Blood Transfusion staff must take risks not donors

In box 2 are the key principles that guided the work in ensuring sufficient quantities of safe blood for anyone that needed it.

At the first International War Surgery Conference in Sarajevo in 1996 researchers confirmed excellent war injury survival results. This was attributed to two factors:

- First, that from the time of injury to being seen by a specialist in the University Clinical Centre was no more than thirty minutes- the range was ten to thirty minutes.
- Second, that blood was always available for those that needed it.

Rather than have members of the public risk their lives by coming to the Blood Transfusion Institute, the staff of the insitute went out in mobile teams to get blood from people near where they were living or working. This was because the targeting of people with shells and by snipers as they went to collect food rations, waited in queues for water, or were rushed to hospital with a war injury was a huge problem. As was the shelling of hospitals. The maternity hospital was destroyed and the two other hospitals constantly shelled.

Key challenges

Box 3. Three questions

1. How to ensure sufficient quantities of blood transfusion related supplies?
2. How to mobilise blood donors safely?
3. How to ensure safe blood supplies?

In ex-Yugoslavia based on cooperation between civil and army blood facilities, each civil blood transfusion centre was encouraged to keep a reserve of blood taking and testing supplies. The recommended amount of supplies depended on factors such as the average number of blood donors per month..

During the first year of the war the siege of Sarajevo was such that it was impossible to deliver any new supplies to the Institute. But because of the efficient implementation of the preplanning policy we had 4 to 5 times greater the quantity of the recommended reserve. Second year onwards the International Committee of the Red Cross and the World Health Organization in particular brought supplies into the besieged city.

Advertising to mobilise donors was not possible as the information might have attracted snipers and shelling. And so young people went with the mobile teams to get members of the public in apartments, shops, underground garages etc. to give blood. We built upon the enthusiasm and willingness of everyone, especially women who were not on the front line, to donate blood. The young people who went out with the professional teams were all volunteers. They were committed to helping despite the risk of injury or death.

The mobile teams were organised in such a way that they went out in small, highly mobile groups. This enabled a greater number of different locations to be covered and reduced the risk of attracting the attention of snipers and shells. The places were changed daily and the blood transfusion vehicle was parked in a different place from where the mobile team was working to minimise the risk of targeting and injuring/killing of donors. During this work all the Institute's blood transfusion vehicles, clearly marked with a Red Cross, were hit, and some staff injured. And when, in 1995, the World Health Organization brought some much needed blood from England into Sarajevo one of their UN vehicles was shot at.

Box 4. How did we ensure safe blood supplies?

For most of the 4 years there were no electricity, gas or water supplies

- Just one and a half years before the outbreak of war the new Blood Transfusion Institute building in Sarajevo was finished, the design fortunately included 3 inter-connecting underground chambers
- With a small fuel supply (20-30 litres for 36 days) a generator put on for up to one hour per day could maintain essential temperatures
- When the generator was turned on all blood samples were ready for ELISA and all other essential tests

There is a myth or presumption that in war there will be a higher than normal incidence of blood transmissable diseases and mistakes in blood grouping. At the first International War Surgery Conferencementioned earlier researchers highlighted that because of attention to detail and quality there was no increase in the incidence of either transmissable diseases or mistakes in blood grouping. The blood taking was always of high quality, in double blood bags, tested for transmissable diseases and divided into components. Because supplies were very low at times we had to use diagnostic materials months past their expiry date. Sensitivity and specificity tests on these products showed that they were OK.

The Blood Transfusion Institute in Sarajevo has 3 inter-connecting underground chambers. Each of the 3 chambers is designed to be maintained at either +2-5 degrees Celsius, -5 degrees Celsius, or -23 degrees Celsius. In summer, when there was no electricity, and the temperature in the first chamber, where blood was stored, was creeping above 5 degrees Celsius, we opened the middle chamber to cool the first. Sometimes, if the outside temperature was very high for example, more than 30 degrees Celsius, it was necessary to open the third chamber to cool the second and first one.

Recommendations for war/siege blood policy

The following are 6 key recommendations. We are hopeful that the experiment in-vivo that we experienced will not be repeated in Europe. But our lessons learnt are relevant to other parts of the world and must also be remembered as a contribution to science and medicine.

No guidelines existed for modern day Europe or from elsewhere when Sarajevo was in a state of siege and war.

1. Centralisation of some aspects of a blood service, such as an information system, is efficient and effective but each smaller facility must be able to carry out a basic service
2. Keep a good reserve of blood transfusion related supplies
3. Blood donor recruitment must rely on taking any and every opportunity
4. Underground inter-connecting chambers for storing blood can be very useful
5. Large amounts of albumin are not required. Whole blood, fresh frozen plasma, fibrinogen, and cryoprecipitating plasma are the key requirements
6. Leadership, risk taking, innovation, and flexibility are key management requirements

Post war strategies

Post Dayton three medium term strategies have been developed:

- Motivation of blood donors
- Safe blood
- Management of blood services

These were chosen as needing priority attention because of the very specific, complex environment that existed post conflict. A long term perspective or vision that explores and questions priorities for the future has also been taken.

Motivation of blood donors

Post conflict there is far less motivation to give blood. The people of Sarajevo no longer see massacres or have family or friends killed or injured due to shelling or snipers. They are also tired after nearly four years of much stress and danger. There was many a sleepless night due to heavy bombing and gunfire, the energy expended just to get a few litres of water was enormous, and people lived on food rations, mostly tinned or dehydrated long life food. Post war stress levels remain high due to uncertainty and poverty. The sum of all these factors is fewer blood donors.

But there is still a demand for blood. The hospitals have undergone a transition period from when almost 100 per cent of the work was trauma surgery to a more 'normal' mix of patients with malignancies, needing haemodialysis etc. Mobilisation of blood donors is therefore now a very specific post conflict challenge, different from either pre-war or during the war.

Safe blood

Post conflict a different type of blood is needed. In war the overwhelming need was for whole blood because of oligemic shock. Now the need is for blood products. This has resource implications. During the second half of the war there were sufficient quantities of safe, basic supplies such as bags and some testing materials thanks to the Red Cross and the World Health Organization. But post war this supply has dried up and the cash strapped post war economy means there is almost no money available to buy materials on the international market. Being in the capital city the Institute can lobby politicians and others but blood facilities in smaller, poorer towns have a major problem.

The management of blood services

Among the many pressing management issues facing the blood service are four outstanding ones: staff morale, laws and regulations, planning blood supplies, and communication.

Good staff morale in 'normal' times is a crucial factor in running a successful blood facility. This issue faces similar problems to those mentioned earlier about the motivation of blood donors. Staff are overwhelmed with thinking not about surviving but about the 'what' and 'how' of the present. How to earn a reasonable salary, what to do about elderly parents now trying to live on a very low pension, how to ensure children get a good education, etc., etc. And is still too much uncertainty about the future because of post conflict political, economic and social factors.

Laws and regulations are fundamental to ensuring a safe blood service. Bosnia and Herzegovina was a new country at the time of the outbreak of war. There was no time, and there was too much uncertainty, to spend time on adapting laws and regulations. Post war we have been exploring relevant European laws and regulations.

Planning blood supplies remains a difficult task. An epidemiological profile of the population that allows for some estimates of the type and number of blood and blood related supplies needed is not possible. There are still movements of people such as refugees and returnees. And an added complication is that there may now be a higher than normal incidence and prevalence of diseases such as cancer and other malignancies due to war related factors such as diet, stress and the environment.

Communication in Bosnia and Herzegovina is not easy especially between the two entities. And more specifically between blood facilities in the two entities. But contact is slowly increasing.

What of the future?

The following box highlights policy and management issues that now need to be addressed in order to put blood services in Bosnia and Herzegovina within a long term strategic framework.

Box 5. A long term strategic framework

- Laws and regulations needed, adapted from European ones
- Change method of financing blood services
- More emphasis on monitoring and evaluation, and control
- Standardisation of procedures and of the quality of products
- Computerised, country-wide, user-friendly information system
- Adapt undergraduate and postgraduate medical training and education curricula to European standards
- One main centre at State level needed but no centralisation of blood services

Apstrakt

U svim transfuzijskim institucijama važi bazični princip: krv mora čekati pacijenta – pacijent ne smije čekati krv. Ovaj princip bio je izuzetno značajan za vrijeme rata i opsade Sarajeva. Time je namatnut i drugi princip: osoble transfuzijske institucije mora preuzeti rizik povrjedivanja i ranjavanja – darivacci krvi moraju biti sigurni. Na bazi realizacije ovih principa u toku rata u BiH i rata u okruženom gradu, izgradili smo vlastite principe i vlastitu doktrinu.

Ona uokviruje motivaciju darivalaca krvi, aplikaciju sigurne krvi i upravljanje transfuzijskom institucijom. Ova strategija dporinjet će u perspektivi etabliranju modela transfuziološke prakse i organizacije u BiH na bazi evropskih regulativa, standarda, dobre prakse, edukacija I traninga.