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Editorial

Improving the Outcome of Emergency Care After Trauma Around the World: Prevention as a Quick Win?

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Emergencies like trauma are very common in the whole world. Traffic accidents, work related accidents, accidents in and around homes, violence and natural disasters are common sources of casualties in need for fast treatment to prevent death or preventable disabilities. And it is sad to say: war, terrorism and criminal violence contribute a lot to the number of casualties. Emergency departments also deal with other emergencies like patients with heart attacks, strokes and ruptured abdominal aneurysms. But we concentrate on trauma in this article.

Emergency departments around the world differ a lot from one to the other. Some are like an ICU unit and like an OR with resources of high performance. In some departments the resources are very pour and these departments might even don't have materials for a proper cast in case of a broken leg. Even needles for IV access might be hard to get. And medicines aren't equally divided around all emergency departments as well.

Departments might have problems with coping with the number of patients. A lack of doctors, nurses, facilities, and resources could prevent optimal treatment of all patients. In some countries the general practitioner will deal with emergencies as well. This means quite a relief for the emergency departments. But not every country has a good system with general practitioners. And in some countries, there are ER doctors and in other countries there are no ER doctors, and this will make a difference as well.

Other problems influencing the outcome after trauma might be the distance to the closest emergency department or the journey to the facility: roads with bad pavements or no normal road, but just a path through the jungle or a mountain area. Or the trip to the hospital is unsafe because of a war or the road impassable after a natural disaster. Fast transport is very important. By plane, by boat, by ambulance or by carrying a patient with any kind of stretcher: everything will do if it is the best way of transport in the circumstances, where the emergency took place. Problems in New York will differ from any rural region in the USA. Three victims of shooting incidents in New York with Level 1 Trauma Centers nearby or a road accident with one severely injured victim in Koyuk in Alaska without a Level 1Trauma Center directly in the area create different problems. A patient after a fall from height somewhere in the jungle in Ecuador or Uganda will have his own problem to get to a suitable facility. The right patient at the right place (with the right resources!) in the right time will be the goal for optimal emergency treatment, but this depends on the resources for transport and care. In general, one can say that how shorter the distance to an adequate equipped emergency department the better the outcome for a lot of emergencies. Maybe the golden hour is less important than it used to be when it had been "invented" and maybe is a longer travel to a better equipped emergency department for a better outcome worth the risk of travelling. On the other hand, there is in the literature an article, which tells us, that every minute counts for the chance to survive during travelling to an emergency department.

Research should be done on this to improve our ideas about transport after trauma: which facility will be good enough to deal with a severely injured patient in the beginning and when will longer transport time might give a better outcome? Is telemedicine of any value for improving outcome when a patient is brought to a less equipped and/or less experienced hospital? And this for many scenarios around the world and in many countries.

The first treatment will be decisive for the outcome. Bystanders help directly after an event happened can be essential. Starting CPR or stop profuse bleeding as soon as possible will improve outcome. Preventing of cooling down is essential as well. Sometimes scoop and run by ambulance paramedics will be the right thing to do. Bringing doctors to the place where an emergency took place might help if it doesn't take too much time to get there. It is important to bring essential knowledge about how to give first aid in case of emergency to as many persons in a population as possible and teach them to do no further harm like the Advanced Trauma Life Support tells us. And when giving first aid, let it be done without fear for being prosecuted later like in the U.S.A. in case of an unfortunate outcome.

In a lot of countries, the population is getting elder. And elderly people "consume" more "time" in emergency facilities, and this gives even more pressure on the emergency departments. A very important ethical/moral issue is: should everyone of every age have the same possibility for treatment? Could we make a good triage system for deciding when treatment is useful and when "something is beyond repair? Medical resources are not inexhaustible! During the corona pandemic this has be an issue and it was hard to solve. Religious opinions and "health culture" opinions on this subject differ around the world. We should accept differences in opinions on this matter.

The above-mentioned problems will make it clear, that there is not just one solution for all emergencies around the world. And not just one way of process of working in all emergency departments around the world. To give patients the best chance to survive without unnecessary morbidity or disability as an outcome, we must deal with all the problems above. Emergency care is "chain care". And a chain is as strong as the weakest link. So, improving your emergency care means pointing out what is the weakest link and then start to reinforce that link.

The best thing is prevention of a trauma, but that is a thing hard to get it done. This means: more taking into account nature when building houses, no more war, no more terrorism, no more criminal violence. Improvement of all roads, perfect maintenance of planes, rail roads, boats, trucks, cars and other means of transport, everyone obeying all the traffic rules: no speeding, no drugs or alcohol before driving, no distraction behind the steering wheel, safety belts on, helmets on during cycling or driving a motorcycle. There are technical possibilities to automatically limit the speed of cars on certain roads like in a city, to prevent driving after drinking etc. But prevention is beyond the reach of us, doctors, and nurses. We only can tell our patients about the possibilities of prevention and tell them, that they have the biggest influence on prevention by showing proper behavior. We can participate in campaigns for prevention, but governments should take the lead in this, especially by legislation, providing means to enforce rules and a justified punishment when someone breaks the rules. Technical solutions for helping to enforce rules might be more worthful than everywhere a policeman. The car industry should help with this by installing these technical solutions in every new car. Both solutions entail costs, but preventing casualties will bring a lot of benefits! Preventing all trauma is impossible, but we should try to reduce the impact of a trauma by protecting us against the impact of trauma. For instance: teaching children how to swim will diminish the risk for drowning!

Something should be done in the field of prevention. In a small country like the Netherlands traffic accidents meant in 2020 a financial burden of € 27 milliard euro (3,3% gross national product) for the Dutch society. In 2021 the total medical costs were 310 million euro. Absenteeism costs total 240 million euro. The Dutch like to cycle. The infrastructure for cycling is in comparison to a lot of other countries pretty good. But in 2022 291 persons (30% of the persons died by a traffic accident) died after a trauma during cycling. 2000 persons sustained trauma capitis and were hospitalized, and 190 persons of this group died because of this trauma capitis. Wearing a helmet during cycling can prevent 29% of all lethal brain damage. And leads to a reduction of 45% of hospitalization because of trauma capitis after a

accident during cycling. There is legislation for wearing helmets during labor in construction. There is legislation for wearing a cap during horseback riding or during short track skating. There is legislation for wearing a helmet during driving a motorcycle or a scooter. But not when cycling, even not for children like in other countries like Iceland, Sweden, and the Czech Republic. A missed chance for prevention? A helmet does not prevent a trauma, but it diminishes the chance for serious head damage after trauma. It is like a safety belt: not prevention of a collision, but prevention of serious damage! A helmet on your way, keeps the neurosurgeon away! A lot of prevention during cycling can be done by someone himself. Be aware of danger, keep your eyes on the road, don't overestimate yourself, good maintenance of your bike, don't get distracted and don't ride your bike with earphones in for listening to music. One should realize after a trauma damage will heal, but nobody will recover for 100%. Tissue changes because of healing, scars, bones might get a little change of position, and this might cause problems in the (near) future. Brain damage might cause epileptic seizures. So, prevention is the ultimate way of keeping a good health! An argument against legislation is the freedom of choice for the individual to make his own choices. But not everyone will realize the consequences of a trauma for the involved person and his relatives.

Emergencies and especially those caused by trauma are a big problem for our health care systems. Every prevented trauma makes a difference. There are some quick wins to make, but governments must decide how to support prevention by legislation. And people should realize what are the sequences of their behavior for themselves and for their social surrounding. As a doctor and a nurse, we only can tell our patients about the sequencies we have seen in other patients. We can start campaigns at schools, at marketplaces, at sport clubs etc. and tell what someone can do to prevent trauma. Will it help? Never shot is always wrong!

A lot of actions are available for improving outcome after trauma. Prevention is one of the actions. Improving knowledge about first aid among the population is a second one: should this be a subject for teaching in schools? Further research will be needed in the field of transporting casualties with telemedicine as a tool of improvement when a patient first is transported to a less equipped facility. We should give attention to the item of triage for solving the problem if our care really is a value based health care.

A lot of work, but always will improving care be our goal!

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