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Emergency Medicine

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Abstract

Emergency defines the potential provision of rapid and effective Medical Nursing Care, in situations where life is threatened. Emergency medicine is defined as the branch of Medicine that operates within an organized EMS. Emergency Medicine System (EMS) is defined as the organized set of provision of immediate pre-hospital, in-hospital and inter-hospital care. Objectives of Emergency Medicine are the provision of an integrated system of pre-hospital, in-hospital and inter-hospital emergency care; improving the quality of emergency medical care; reduction of mortality, morbidity and disability related to injury and sudden illness. Collection of epidemiological data related to accident prevention and health promotion.

Keywords: Emergency Medicine; Trauma; Airway; CPR.

1. Introduction

ABC and its variations are the basic steps used by medical professionals in emergency medicine. In its original form it represents the following: airway, breathing and circulation. The protocol was originally developed as a memory aid for rescuers performing CPR, and its most widely known use is in the care of the unconscious patient, although it is also used as a reminder of patient assessment and treatment priorities in many acute medical conditions. Breathing and circulation are essential to life. ATLS (Advanced Trauma Life Support) program of the American College of Surgeons. ABCDE' S : mnemonic rule for approaching multiple injuries and labeling life-threatening injuries, based on the order in which they are life-threatening. Systematically checked: A(Airway) ensuring the patency of the upper airways, while simultaneously protecting the cervical spine; B(Breathing) ensuring breathing and ventilation; C(Circulation) ensuring circulation and stopping any bleeding; D(Disability): Neurologic (status) assessment of the neurological condition; E(Exposure/Environmental control) full exposure of the patient with simultaneous protection from hypothermia. Check of responsiveness, neck and head injury (fall from a height, car accident); assessment of the situation. A tap on the sternum will determine that the patient is indeed unconscious. Not performance of CPR on a patient, who is not fully awake, but is breathing and has circulation. Close approach if it's breathing (See - Hear - Feel). Airway control; the victim must be in the correct position. If there is any exudate (vomit, blood, etc.) in or around the person's mouth must removed to clear the airway. It must be on a surface as flat as possible. Ensuring that hands of patient are under the sides and his back and legs are straight; open of the airway, head and trachea must be properly aligned; tilt head back towards the sky. There may be situations where the airway is blocked. This can be from a foreign object, the victim's tongue, or vomit or other bodily fluids. Quickly turn the victim's head to one side to aid dislodgement. If the tongue is blocking the airway; try the mandibular traction method; Lift the chin slightly towards the sky without moving the rest of the head. This helps the tongue to drop to the floor of the jaw, despite the arrangement of the airway. Breath control: obvious signs of breathing; there are some obvious signs, that the victim is breathing; look for the rise and fall of the diaphragm. If the patient shows great difficulty in breathing, the circulation is checked. Placement of the hand near the nose and mouth of the patient to see if it's breathing. Normal breathing, there is no need for CPR. Opening the airway may be enough to start the patient breathing again. Traffic control; the index and middle finger, just below the jaw, to the right or left of

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the larynx or on the Adam's apple. This is the carotid artery and should provide a strong pulse if the blood is circulating well. If the pulse is weak or if there is no pulse, perform CPR; is not breathing and his pulse is weak or absent, you should perform CPR (30 compressions at a rhythm. We give two full inhalations lasting 1-1.5 sec each)

2. Wound

Treatment of the injured follows the practice of collection and rapid transport or the practice of on-site stabilization. Its goal is to identify and deal with situations that put his life in immediate danger. This phase requires recognition and treatment of life-threatening conditions such as tension pneumothorax, massive hemothorax, airway obstruction, cardiac tamponade, and hemorrhagic shock. Time works negatively in the case of the injured. The primary assessment should be completed in the shortest possible time. Primary assessment consists of a structured rapid assessment and treatment of situations, which put the injured person's life in immediate danger. The assessment follows the following steps: A- Airway (Airway) and cervical spine stabilization; B- Ventilation (Breathing); C- Circulation; D- Neurological Assessment (Disability); E-Exposure. Air duct and stabilization of cervical spine: assessment of airway patency must be done quickly because it is essential. The first approach will give us important information. If the victim is talking, then there is an adequate airway and some degree of ventilation. Absence of breathing, reduced chest expansion or the presence of pathological sounds such as snoring or wheezing, are signs of complete or even partial obstruction of the airway, which require immediate treatment. On the other hand, its opening airway in the multi-injured patient always encounters the obstacle of possible damage to the cervical spine. For this reason cervical spine should be immobilized. The basic means of securing the airway are manual opening manipulations, auxiliary means (airways and suction), while specialized manipulations include tracheal intubation and the use of supraglottic ventilation devices. Stabilization of cervical spine: It is a process that already begins with the control of the airway. Stabilization of cervical spine is achieved by the use of a hard collar. The presence of neurological deficit or pain as well as the mechanism of injury play an important role. Also cervical spine stabilizes at a disturbed level of consciousness and substance use. Ventilation (Breathing): assessment of ventilation by speech and pulse oximetry. A respiratory rate of 12-20/min is considered to be in the normal range. Also, the symmetry and expansion of the hemithoraxes give some evidence for the adequacy of ventilation, as does the auscultation of the ribcage. In hypoxemia, which is not corrected with supplemental oxygen administration, selective tracheal intubation and mechanical ventilation are indicated. Regarding respiratory support, the available pre-hospital means are the self-expanding bag (ambu) and portable ventilators (choice of ventilation model, administration of high FiO2). Circulation: if the patient responds to verbal stimuli, then he has an elementary circulation, capable of maintaining his brain function. The existence of confusion, agitation and the reduced level of consciousness can perhaps be attributed to hemodynamic instability. Palpation of the pulse in peripheral vessels, such as the carotid artery, indicates the presence of blood pressure ≈ 80 mmHg, while simultaneously counting the number of pulses and its quality. The skin provides equally important information. Cold clammy skin indicates hypovolemia. Capillary refill speed (≈ 2 min) and pulse oximetry are altered by cold and the state of the vascular network. Neurological assessment (Disability): rapid neurological examination is concerned with the assessment of the level of consciousness, the assessment of the size of the pupils and the presence of mobility in the extremities.The basic tool for assessing the level of consciousness is the Glasgow scale. The Glasgow scale measured in the first few minutes often changes rapidly after the first resuscitation efforts. However, the presence of a non-improving Glasgow score <9 is an indication for sedation, tracheal intubation and mechanical ventilation. A second point of attention is the pupils of the eyes. The existence of anisocoria, mydriasis without reaction to light or myses, probably indicate serious intracranial pathology. Exposure: removal of casualty's clothing and rapid assessment of injuries is essential in finding injuries. As hypothermia is a major problem during transport of the multi-casualty, exposure must be limited to the shortest possible time. Secondary assessment: secondary assessment begins after primary assessment has been completed and immediately life-threatening situations have been addressed. In no case is the transfer delayed to clinical assessment is completed at this stage. The head is examined for signs of external bleeding, abrasions, bruises or hematomas, fractures. The cervix is explored for hematoma or subcutaneous emphysema. Grinding in the area of the larynx, in combination with the larynx and subcutaneous emphysema are signs of a fracture of the larynx. At the same time, the carotid arteries are palpated and listened for a murmur. Examination of the chest is of particular importance, since it may conceal potentially life-threatening injuries, which at first assessment did not give any signs. Thus screening for decreased or paradoxical tracheal mobility or displacement, the presence of strangulation, the presence of percussive bluntness or tympani and finally listening to abnormal sounds may reveal the presence of hemothorax or pneumothorax. If this is a titratable injury, whether the course involves the heart and great vessels or the lung parenchyma should be investigated. Examination of the abdomen likewise includes, in principle, episcopal investigation of possible signs of injury. Of particular importance, however, is the palpation of the abdomen for the presence of tenderness. This examination in a relatively stable patient is done during the secondary assessment. But since we have to deal with an unstable patient, who requires sedation, intubation and mechanical ventilation, a quick assessment of the abdomen for the existence of tenderness should be done already from the primary assessment. The pelvis may be a site of extensive blood loss. In addition to exploring for hematomas, external bleeding, abrasions, or bruising, the pelvis should be explored with

anterior-posterior pressure of the pubic symphysis and bilateral pressure on the iliac crests for pain or instability. Finally, the limbs are examined for deformity, reduced mobility, disturbed blood supply. Trauma involving the chest, abdomen, pelvis, and retroperitoneum is often accompanied by significant blood loss. Fractures of long bones with hematomas may have a blood loss of 2-4 units. The most common cause of shock in injured people is bleeding. Other forms of shock such as cardiogenic shock (cardiac tamponade, tension pneumothorax, myocardial contusion), neurogenic shock (spinal cord injury) and septic shock (usually occurring in the second year) may be present but are uncommon. The American College of Surgeons, in an effort to evaluate blood loss and establish a uniform strategy in the treatment of the injured, has established a classification of blood loss according to the clinical picture of the injured and suggests the corresponding treatment. Treatment of hypoglycemia is by administration of crystalloid solutions in sufficient quantities. Blood and blood products are not a priority. Of course, the main condition for dealing with hemorrhagic shock is the control of the bleeding. We should not underestimate blood loss from external wounds, bleeding that is easily controlled with external pressure. Casualty response to rapid administration (bolus) of 2000 ml R/L (recommended by ATLS) may to give us information about the amount of bleeding, the need for a transfusion and the possibility of surgery.

3. Traumatic Brain Injury (TBI)

- GCS = 13 - 15. Loss of consciousness for a short period; very good prognosis; mortality <1%
- GCS = 9 - 12. Good prognosis; mortality <5%
- Severe GCS <8. Mortality >40% high rate of residual damage.

Primary lesions include vascular rupture, hematoma formation, early ischemia and neuronal necrosis. Secondary lesions occur gradually in a second year. Hypotension, hypoxemia, and hypercapnia may result, resulting in increased intracranial pressure and cerebral edema, resulting in cerebral hypoxia. The little one period of low blood supply and hypoxemia can cause secondary ischemic damage that is often irreversible. Airway obstruction with breathing disorders is common in TBI injured and is directly related to the severity of the injury. Intubation if GCS<8; application of mechanical breathing support; securing a venous line and administering fluids; stabilization of the cervical spine, with the placement of a cervical guard; administration of sedation and analgesia drugs; rough neurological assessment of the injured person's condition before administration of sedation; assessment of pupil size and reaction to light. Monitoring should initially include ECG, measurement of systemic blood pressure, pulse oximeter, capnograph. Performing a CT scan of the brain. Diagnostic abdominal lavage or FAST to confirm or rule out intra-abdominal bleeding.

4. Chest injuries

Chest injuries account for 25% of injury deaths. They involve the chest wall, the pleural space, the lung parenchyma and the meso-pneumonia. The casualty with a chest injury may have: rib fractures; unstable chest; pneumothorax; hemothorax; tension pneumothorax; rupture of the tracheobronchial tree; pulmonary parenchyma fractures. The most common chest injuries are rib fractures and accompanied by pulmonary contusions, hemothorax, pneumothorax and abdominal organ injuries. When the fractures are located in two parts and involve three or more sides in the same hemithorax, then we speak of an unstable chest. The hemithorax loses its stability and exhibits paradoxical mobility. An unstable chest means significant lung injury with underlying intrathoracic or intrapulmonary injury. A pneumothorax is the collection of air inside the pleural cavity. The pneumothorax can be open or closed depending on whether it communicates with the atmosphere. The continued accumulation in the pleural cavity without the possibility of exit creates a life-threatening situation for the injured person, the tension pneumothorax. Hemothorax is the collection of blood in the pleural cavity, often coexisting with pneumothorax. The initial management of chest injuries is based on clinical assessment and does not require radiological examination. Tension pneumothorax, the pressure in the pleural cavity under normal conditions is negative, the outflow of air greatly increases the pressure so that the lung cannot be expanded, the mediastinum moves to the opposite side, venous return is obstructed, and cardiac output is reduced. The diagnosis of pneumothorax is clinical and not radiological. Clinical signs for suspected pneumothorax are: shortness of breath; hypotension; absence of respiratory murmur; stretching of the cheekbones; tracheal displacement; cyanosis. Coping: direct needle decompression; placement of a chest tube. Open pneumothorax, there is communication between the thoracic cavity and the atmosphere and is usually due to penetrating trauma. Coping: conversion to a closed pneumothorax; placement of a chest tube; intubation if necessary; possible surgical treatment. Large hemothorax is usually due to transtiter wounds with ruptured vessels, but it can also be present in blunt injuries. Diagnosis: chest injury; hemorrhagic shock; absence of respiratory murmur; flat cheekbones. Coping: absolute indication for intubation; aggressive fluid administration; placement of a chest tube; possible thoracotomy. Indications for thoracotomy: hemodynamic instability despite aggressive fluid and blood administration; blood loss >1500 ml with drainage tube placement; persistent bleeding >200 ml/h for >4 h; inability to control bleeding. Emergency thoracotomy in the

Emergency Department (ED) may be lifesaving for some titratable heart injuries. The goals of this intervention are: relief from cardiac tamponade; control of bleeding from the heart and large vessels; application of open heart massages; blockage of the aorta and redistribution of blood to the heart and brain. Unstable chest, diagnosis is clinical and not radiological: existence of fractures of two or more ribs in two or more places; existence of paradoxical mobility; possibility of hemothorax, pneumothorax or both; or display them later. Damage to intra-abdominal organs coexist in 15%. There is usually underlying lung parenchymal damage; mortality is related to lung injuries and not to chest wall injury; need for intubation for prehospital respiratory support; possible surgical treatment; need for ICU hospitalization and mechanical respiratory support. Clinical approach to the casualty with chest injury. The diagnosis of chest injury is not easy in blunt injuries and before an imaging test is performed. Evaluation parameters for the possibility of chest injury form: mechanism of injury; application of great force to the chest wall; sudden deceleration. Points: deformation of the chest cavity; fractures or trauma to the chest wall; stretching of the cheekbones; subcutaneous emphysema. Symptoms are shortness of breath, tachypnea, way of breathing, paradoxical mobility, absence of respiratory murmur, hemoptysis, hypotension, pain.

4.1. Injuries of thoracic aorta

Traumatic rupture of the thoracic aorta is immediately fatal in 75 – 90%, as the mechanism of rupture of the thoracic aorta in blunt injuries is abrupt deceleration. In the plain chest X-ray in the supine position there may be findings suggestive of a possible aortic rupture, such as: fractures of sternum and scapula; first rib and clavicle fractures; multiple rib fractures; unstable left hemithorax; findings from the mediastinum; ambiguity in the outline of the aortic arch; widening of the mediastinum > 8 cm; levin deviation; tracheal displacement; massive hemothorax; diaphragm rupture. Helical computed tomography is diagnostic for aortic injuries, while transesophageal ultrasound is easily performed in the ED without moving the injured person. Aortography is the test of choice. Coping, the surgical treatment with endovascular repair of the damage. Measures to be taken: ensure airway and breathing; administration of analgesia; blood pressure control with the goal that the systolic blood pressure does not exceed 100 mmHg.

4.2. Abdominal injuries

Intra-abdominal organ injuries can be caused by blunt and penetrating injuries. They are accompanied by significant blood loss up to shock. The presence of subdiaphragmatic air is an indication of rupture of the hollow viscera. Fractures of lower ribs are often present in splenic or liver injuries, while abnormal Levin course is present in diaphragmatic rupture. Coping: use of FAST helps us detect intra-abdominal bleeding; peritoneal lavage; computed tomography; diagnostic peritoneal lavage is considered an acceptable method for trauma victims with a sensitivity exceeding 90%, but its usefulness in trauma victims is controversial. Depending on its findings, it can be positive or negative. Indications for emergency laparotomy: hemodynamically unstable casualties with positive abdominal wash or ultrasound positive for bleeding; persistent hypotension despite fluid administration; signs of peritonitis; presence of air in the peritoneal cavity; visceral discharge from the wound; hypotension in a casualty with dititratable abdominal trauma; bleeding from stomach, rectum or genital tract in titrating wounds; shooting in abdomen; diaphragm rupture; bladder rupture.

4.3. Orthopedic injuries

Their treatment is of secondary importance in the first phase of resuscitation. The most important orthopedic injuries are pelvic fractures and long bone fractures. Plain x-ray of the pelvis should be done in every seriously injured person even if there is no evidence of pelvic injury. Pelvic fractures, depending on whether the pelvis remains stable or not, are divided into: Type A: Fixed pelvis; Type B: Partially fixed pelvis; Type C: Unstable pelvis. Unstable pelvic fractures should be stabilized with external osteosynthesis in the ED before any movement of the casualty. Casualties with pelvic fractures that continue to bleed despite fixation with external fusion should be referred for angiography and possible embolization. Angiography should also be performed in injured patients in whom contrast leakage is observed during CT. Pain should be treated promptly with intravenous opioids.

Massive hemothorax: rapid accumulation of more than 1500 ml of blood in the chest cavity. Shock with absence of respiratory murmur and bluntness on percussion. Treatment is blood volume restoration and chest cavity decompression. Immediate thoracotomy: if 1500ml of blood is immediately evacuated. Open pneumothorax, large open gaps in the chest. With each respiratory effort, air passes through the opening and leads to hypoxia and hypercapnia. Treatment: pad is fixed on three sides, while the fourth remains free. Unstable chest, asymmetrical and uncoordinated movements of the chest. Limited range of breathing. Screaming from rib or cartilage fractures. Treatment: adequate ventilation. Re-expansion of the lung. Cardiac tamponade. In shock characterized by insufficient tissue perfusion and oxygenation, we follow two steps: the first is the clinical assessment and the second is the identification of the possible cause and the mechanism of injury. Clinical signs of shock are cold and pale extremities, tachycardia and hypotension. Shock is clinically differentiated into: A. Hemorrhagic; B. Non-hemorrhagic: Cardiogenic, myocardial contusion, cardiac

tamponade, air embolism, rare myocardial infarction; Neurogenic, spinal cord injury: hypotension without tachycardia and without skin vasoconstriction, due to loss of sympathetic tone;, Septic, delayed arrival – titrating abdominal injuries. Clinical differentiation from tension pneumothorax should also always be made. The most common cause of shock is bleeding that can come from the peritoneal cavity, pelvis, retroperitoneum and chest cavities. Assessment of blood loss is based on blood pressure, respiratory rate, diuresis, level of consciousness, and response to fluid administration. When during initial fluid resuscitation, the patient is unresponsive, then there is a need for immediate surgical intervention. In head trauma to avoid secondary brain damage, cerebral irrigation and cerebral blood flow should be enhanced. This is achieved by reducing elevated intracranial pressure, maintaining normal intravascular volume, mean arterial pressure, oxygenation and carbon dioxide levels. At regular intervals, the level of consciousness should be assessed with the Glasgow scale. Glasgow Scale - GCS < 8 severe CCI - craniocerebral injury, GCS = 9-12 severe CCI, GCS > 13 light CCI. Pupils should also be checked for size and reaction to light.

The grading of the Glasgow scale according to the parameters: eye opening, speech and mobility is as follows:

Table 1 Glasgow scale

Component tested	Score
Eye response	
Eyes open spontaneously	4
Eye opening to verbal command	3
Eye opening to pain	2
No eye opening	1
Motor response	
Obeys command	6
Localises pain	5
Withdraws from pain	4
Flexion response to pain	3
Extension response to pain	2
No motor response	1
Verbal response	
Oriented	5
Confused	4
Inappropriate words	3
Incomprehensible sounds	2
No verbal response	1

4.4. Burning disease

The severity of a burn depends largely on the extent of the burned surface. Its quantitative assessment is calculated by measuring the percentage of the burned surface on the total surface of the body. The most popular method of calculating burn surface area is based on Wallace's "rule of nines". According to him, the various areas of the body have been divided into 9% or multiples of that except for the perineum area which is estimated at 1%. Another method is based on the fact that the patient's palm constitutes about 1% of the O.E.S. The number of "palms" covering the burn surface corresponds to the percentage of damage. Both of these rules are considered inaccurate for children because the anatomical proportions are different from those of adults. The qualitative assessment of a burn wound is based on the assessment of its deep extent. Thus, the necrosis can concern only some layers of the skin (partial thickness) or all layers (full thickness). Characteristic of a partial thickness burn is the necrosis of the epidermis and perhaps the superficial layer of the dermis, so that epithelial elements from the skin appendages (hair follicles, excretory ducts of sweat and sebaceous glands) remain. From these epithelial elements will come the healing of the burn surface with the process of epithelization. On the contrary, in full-thickness burns, all layers of the epidermis and dermis are damaged, with the result that the wound heals only by the growth of granulation and then scar tissue. Depending on the depth of the damage, first to third degree burns are distinguished. The first degree burn concerns only the skin, the second degree extends to the dermis and the third degree includes all layers of the skin. Some report a fourth degree burn injury where the necrosis extends to muscle, subcutaneous fat and even bone. The clinical assessment of depth of a burn is based on four clinical signs: sensation, blistering, color and texture of the skin. Qualitative assessment. First degree (partial thickness): erythema, pain; second degree (full thickness): erythema, large blisters, swelling, pain; third degree (total

oah): parchment-like texture, variable color, bubbles small, thin or no anesthesia. Securing the airway. Complications related to the respiratory system are one of the most important causes of death in burn victims. Treatment of inhalation burn should be started before the exact diagnosis can be made. All patients must be given 100% oxygen. Ensuring an open airway is vital for fire victims, particularly those with inhalation burns, where swelling of the airways quickly develops. Delay in treating and securing an airway can lead to obstruction with catastrophic consequences. A large-sized endotracheal tube should be placed to allow drainage of secretions and bronchoscopy. Indications for immediate: patients with disorders of the level of consciousness, in a comatose state; full thickness burn localized to the face and neck; in the beginning of airway obstruction due to edema or laryngospasm; in full-thickness burns of the chest wall • in coexisting chest injuries and other serious injuries; in inhalation burn; control of the adequacy of respiratory movements in patients with circumferential burns of the chest, where an emergency escharotomy may be required. The dose used is 5 g by slow intravenous infusion. Burn damage is characterized by the development of burn shock. Burn shock is due to a combination of hypovolemia and the local and systemic secretion of a large amount of inflammatory mediators. The most popular equation for calculating administered fluids is the Parkland equation: R/L 4ml × body weight (kg) × EU % - 50% of the volume of liquids is given in the first 8 hours, the rest – in 16 hours; if estimation of EU is not immediately possible, administration of 20 ml/kg of body weight is recommended; crystalline solutions during the first hour of injury; the first 24 term it is recommended to use only crystalline solutions. Factors that increase the need for administered fluids: inhalation burn; delay in fluid administration; electrical burn; extensive extent of the burn surface; concomitant injuries; in recent years, the so-called "fluid creep" phenomenon has been described; prone to excessive fluid administration with negative systemic and local effects, such as: abdominal compartment syndrome with adverse effects on liver, kidney function and function of the gastrointestinal system; pulmonary edema; need for palliative escharotomy; prolongation of mechanical ventilation and hospital stay; increase in morbidity and mortality.

4.5. Crush-syndrome and rhabdomyolysis

For the first time it has been described after the bombing of London during the Second World War. The syndrome occurs during natural disasters, wars, explosions, industrial accidents. The compression of muscle masses leads to tissue ischemia, an increase in tissue pressure, which exceeds capillary filtration pressure. After the external pressure is removed the muscle tissue is re-perfused. The ischemia-reperfusion injury mechanism is the basic pathophysi-logical mechanism of this syndrome. Often pressure damage is combined with vascular damage, traumatic rupture of vessels, thrombosis and embolism. Congestion syndrome is clinically manifested by hypovolemia symptoms due to large fluid accumulation in damaged tissues and symptoms resulting from the release of a large amount of toxic substances from the injured tissues. The first manifestation of the syndrome is usually hypovolemic shock, which is also the most frequent cause of death during the first 4 days after the injury. Hyperkalemia with its effect on the functioning of the heart is the second cause of early death. Myoglobin is a protein that makes up 1-3% of the dry weight of muscle tissue. Under normal conditions myoglobin binds to haptoglobin and α-2 globin and is eliminated through the reticuloendothelial system. The saturation of haptoglobin (when a large amount is produced of myoglobin) leads to an increase in free myoglobin in the plasma which is excreted by the kidneys. In the renal tubules myoglobin creates complexes (casts), especially in acid environment. Urine alkalinization reduces the formation of these complexes . Myoglobin causes a direct action on the renal tubules contributing to the increase of free oxygen radicals and promoting fat peroxidation. This action of myoglobin is also limited to alkaline environment. Diagnosis. Patients usually present with: extensive soft tissue injury with ischemia-reperfusion, edematous extremities, compartment syndrome, dark urine, positive test for hemoglobin, absence of red cells in the urine, increased CPK levels in the blood. Management: aggressive fluid administration; administration of mannitol; urine alkalinization (pH > 6.5) with bicarbonate. In addition to the alkalinization of the urine, the positive effect of bicarbonate is also due to the treatment of hyperkalemia. Hypocalcemia should not be treated aggressively because the greater amount of calcium accumulates in muscle and exacerbates rhabdomyolysis. Surgical transection of the deep fascia if compartment syndrome occurs. Irreversible damage to muscle tissue and nerves is seen after 6-8 hours of ischemia. Limb amputation in cases of extensive and irreversible tissue damage.

4.6. Cardiopulmonary resuscitation

Cardiopulmonary resuscitation is the procedure aimed at restoring oxygen transport to the tissues, determining the specific causes of cardiac or respiratory arrest, and maintaining whatever functions are saved. Cardiac arrest or cardiorespiratory arrest is defined as the sudden and unpredictable failure of circulation or breathing, or both, resulting in inadequate supply of oxygenated blood to vital organs and cells. Basic Life Support (BLS) or Basic Cardiopulmonary Resuscitation is maintaining the patency of the airway and supporting breathing and circulation without the use of any special equipment except possibly a protective cover . Basic CPR is attempted in CPR because it has been shown to provide a small but critical amount of blood for the needs of the heart and brain, and only CPR and defibrillation can improve survival rates in CPR. The time required to cause irreversible brain damage from the moment the heart stops functioning is about 4 minutes. In 10 minutes certain brain death occurs. The main clinical signs of cardiorespiratory

arrest are: absence of pulse in the great vessels; loss of consciousness (10-20′′ after the arrest); stopping automatic ventilation (15-30′′ after stopping); absence of heart sounds; dilation of the pupil (60-90'' after stopping). Ventilation and compressions. After 30 compressions: open the airway again (head extension – chin lift); administer 2 inhalations lasting 1′′ each; give 30 compressions again; continue compressions and inhalations in a ratio of 30:2; stop to recheck only if the victim begins to breathes on his own. Otherwise don't stop revitalization. If during the first 2 inhalations it does not occur normal chest expansion, check mouth's victim and remove anything causing obstruction. If there is another rescuer change every 1-2 minutes for avoiding fatigue. In children we start with 5 puffs. The ratio of chest compressions to inhalations is 30:2 when the rescuer is alone. When there are two rescuers the ratio of chest compressions-infusions is 15:2

5. Conclusion

ABC is a resuscitation sequence that was developed for assessing and treating critically injured trauma patients. It has been widely accepted and used by experts in emergency medicine and trauma to guide resuscitation and improve outcomes in trauma patient. ATLS has morphed from its original construct of describing initial care of the injured patient at a small, often rural facility, to becoming the default for trauma resuscitation in multiple settings.

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