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Rapid Sequence Intubation for Head Injury Patients. A Practice

Sekwencja Szybkiej Intubacji u pacjentów z urazami głowy. Praktyka

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Abstract

Rapid Sequence Intubation is one of most commonly applied procedures for trauma patient in emergency practice such as Medical Rescue Service as Emergency Hospital Ward, but in the case of patients with maxillofacial trauma it is usually complicated. Firstly the trauma directly involves the airway, but also the commonly associated injuries and conditions, such as craniocelebrar injuries often limit the options in management. The aim of this article is to describe rapid sequence intubation protocol for this group of critical injured patients. **(JNNN 2016;5(1):28–30)**
Key Words: rapid sequence intubation, intubation, emergency airway puncture, maxillofacial trauma, head injury, Medical Rescue Service

Streszczenie

Sekwencja Szybkiej Intubacji jest jedną z najczęściej stosowanych procedur u pacjentów urazowych w ratownictwie medycznym jak również w Szpitalnym Oddziale Ratunkowym. Procedura ta ulega skomplikowaniu u pacjentów z urazami twarzowoczaszkowymi oraz współistniejącymi urazami czaszkowomózgowymi. Celem artykułu jest opisanie protokołu szybkiej intubacji dla tej grupy pacjentów. **(PNN 2016;5(1):28–30)**
Słowa kluczowe: Sekwencja Szybkiej Intubacji, konikopunkcja, uraz szczękowo-twarzowy, uraz głowy, Zespół Ratownictwa Medycznego

Introduction

The Rapid Sequence Intubation (RSI) is a commonly used method of respiratory protection against gasping, especially in trauma patients. In Poland, RSI protocol has been modified due to the need to adapt to the conditions of the emergency medical team. Head injuries, including craniocelebrar injuries with accompanying injuries within the facial skeleton are an essential issue which must teams must face.

The aim of the work is to discuss the problem of modification of the RSI Protocol in this group of patients.

Rapid Sequence Intubation

Rapid Sequence Intubation (RSI) is the recommended method for respiratory protection against gasping, particularly in trauma patients. RSI stands for quick induction to the anesthesia, however, in literature it occurs in both the determination of induction and endotracheal intubation [1,2] This widely used technique is based on the patient's oxygenation (preoxygenation), induction of anesthesia, muscle relaxant drugs and performance of endotracheal intubation. The main purpose of the RSI is a quick protection of the patient against aspiration of food content, which is a common cause of serious complications and deaths. The RSI Protocol is implemented by the rescue team leader or a person who has the best experience in endotracheal intubation: 1) preparation of necessary equipment for

endotracheal intubation, medication and equipment to carry out alternative methods, 2) start monitoring the patient: hemoglobin saturation with oxygen (SpO2), heart rate (HR), non-invasive blood pressure measurement (NIBP) of the heart electrical function (ECG) [2,3]. In the literature, classic RSI is based on anaesthetic using etomidate (0.3 mg/kg iv) and suxamethonium (1.5 mg/kg iv) [1–3]. For patients with cardiovascular disease it is recommended to reduce by half the dose of etomidate. Etomidate is the drug of choice because it works most reliably on the circulatory system, compared with propofol or tiopental [4], but it does not apply to emergency medical teams in Poland. Propofol is applied 2–3 mg/kg, Thiopental 5 mg/kg or Ketamina 2 mg/kg iv. Currently, in Poland rocuronium is commonly applied as the alternative for suxamethonium (0.6–1 mg/kg iv) [2] Head Injuries. The road traffic accidents and beatings are the major cause of head injuries in the population. It regards mainly men aged between 20–40. Intubation is more difficult and complex in the case of face skeleton fractures. There are fractures of the upper, middle and lower parts of the face. Among the fractures of the upper part of face, depending on the clearance plane, the direction and strength of the trauma there are breaking the cranio-orbital fracture, frontal-orbito-nasal fracture and the upper face massive displacement. In the case of these fractures associated with bruise and swelling of the brain, the occurrence of intracranial hematoma, fractures in the anteriol and the middle cranial fossa, the patient's condition requires rapid airway protection and multidisciplinary treatment of: the neurosurgeon, neurotraumatologist, maxillofacial surgeon and the intensive care team. Among the fractures of the middle part of the face there are isolated fractures of the orbital fracture, zygomatic-orbital fracture, zygomatic-maxillo-orbital fracture and orbitonasal displacement [5–7] Unless it is accompanied by multiorgan injury, they are generally not life-threatening. Fractures of the lower part of the face in the form of mandibular fractures on both may lead to coverage for the front of the tongue and its maturity by closing the airway. However, it should be noted that all of the aforementioned injuries, broken teeth or prosthetic restorations, bleeding in the mouth and swelling in this area always carry a possible risk of airway obstruction and require bservation and often also the airway intubation [7]. Modification of the RSI in a patient with maxillofacial trauma. Trauma within the facial skeleton is difficult and often prevents the use of classical RSI protocol. Treatment of injuries within the facial skeleton requires free access to the oral cavity and most cases applyin intermaxillar fixation, which is not possible in the case of tracheal intubation through the mouth. It is worth noting, however, that the aforementioned injuries are often accompanied by breaking in the front and the middle cranial fossa, which is contraindication to intubate through the nose. Therefore, in the situations of emergency there should be applied intubation through the mouth and the way of intubation should be changed before the operation or performing tracheostomy or submental intubation [7] However, there are cases in which damage to the faces is so severe, that it is not possible to execute intubatation through the mouth. In that case the RSI protocol should be modified. The first modification — in the case of bleeding, movable sections of the bone of the mandible, tongue collapsing, leaving foreign bodies (food scraps, fragments of teeth, prosthetic restorations), first having drained off the liquid content, they should be gently removed them with the use of Mogilla forceps. In order to make the intubation easier. use the bougie [2]. The second modification, in the case of major damage to the covering the bottom of the mouth, strong bleeding from and ineffective removing of foreign bodies and the blood from the airway, or when the direct laryngoscopy increased the damage and not giving certainty for the possibility of intubation, or the mandibular fractures prevent opening the mouth, it is necessary to execute puncture of cricothyroid ligament-shield (emergency airway puncture) or carry out submental intubation (in the case when there are connection between Modification of drugs. In Poland the drugs of first choice for induction of anesthesia in medical rescue teams are propofol or tiopental. Tiopental is not recommended in the case of patients with milutiorgan trauma and hypovolemic shock, because this type of drugs by the greatest cardiodepressy results in lowering blood pressure. Its advantage is that this drug is neuroprotective in brain tissue, which can be useful in the case of cranio-cerebral trauma, often co-existing in this group of patients. Propofol is a drug becoming more accessible, and easier to apply compared to tiopental because it does not require dissolution, which in the case of rapid inductions is of great importance. Propofol is not approved for induction in patients with epilepsy, since according to a number of authors it is pronvulsive. Based on the longstanding experience of the authors, it appears that the pre-hospital aid in the case of RSI very rarely used muscle relaxants. Contrary to the terms of Emergency Department of the Hospital. In patients with the so-called difficult air passages trying to execute the intubation, the patient in the anesthesia, but on their own breath. Muscle relaxant drugs should be applied to stop the patient's breath of residual injury, although it does not give the certainty for the possibility of intubating the patient. Rescue teams in Poland do not have drugs for reversal of neuromuscular blockade such as Sugammatex, Neostygmina. Besides, specialized rescue team are equipped with muscle relaxants. Most teams are basic rescue medical teams. In summary, it seems that the RSI is better in a combination of intravenous an-

aesthetics with opioids such as Fentanyl than in the combination of anaesthetics with muscle relaxant drugs.

Summary

Intubation of patients with craniofacial trauma (Figure), especially with a particular craniobrain trauma is always a quick and dramatic procedure. In addition, some physiological and anatomical conditions such as: large tongue. "a short neck" swelling of tissues in the course of pregnancy, generate problems with the epiglottis showing and complicate tracheal intubation. In a situation where anatomical, physiological conditions overlap the difficulties arising from the nature of the injuries, a modification of the RSI protocol ought to be considered. Patients with head injuries need multidisciplinary treatment from the early moments while they are being taken to hospital. The team of Emergency Unit should be supported by other specialists, particularly by the Otolaryngologist, Neurotraumatologist, Neurosurgeon and Maxillofacial Surgeon, in order to perform tracheal intubation with fiberoscopy, percutaneous or submental tracheostomy.

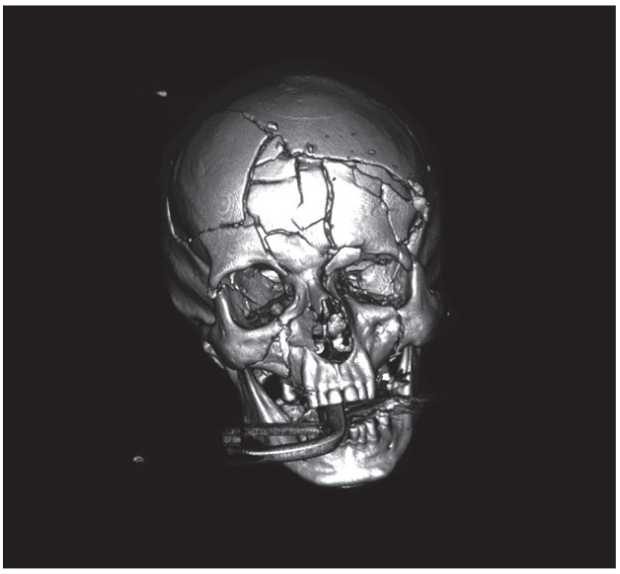

Figure. An example of the patient with craniofacial trauma

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