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Organ donation as an element of quality assessment of intensive care units in Warsaw hospitals

ABSTRACT

Introduction:

Transplantation is the best treatment of an end-stage organ failure. Poland, like any country in the world, is facing an organ shortage. It is one of the greatest challenges of modern medicine. The only available source of organs for transplantation so far is human beings. Ninety-five per cent of organs in our country come from deceased, and only 5% from living donors. Even though, Polish legislation has allowed procurement of organs after irreversible cardiac arrest (SCA) since 2010, deceased donors were identified according to circulatory criteria (DCD) only in 2015-2019. Nineteen potential DCD donors were identified nationwide, 17 of them became actual donors (kidneys were harvested). Hence, the main source of organs procured is people diagnosed with death due to permanent and irreversible cessation of brain function (known as brain death (BD)).

The procedure for diagnosis of death according to neurological criteria consists of two stages. The first, in which any doctor determines the onset of primary stem areflexia, establishes the cause of brain damage and begins a period of initial observation. The second including: repeat analysis of findings and exclusions, double clinical examination (confirming truncal areflexia and persistent apnea), and instrumental examination (in certain cases). The second stage of brain death diagnosis requires participation of two specialists: an anesthesiologist or neonatologist when appropriate (Physician 1) and neurologist/pediatric neurologist or neurosurgeon (Physician 2). Physician 1 is required to personally participate in both series of examinations conducted, Physician 2 participates only in the second series. The participation of anesthesiologists in the procedure for determining brain death

means that the identification of potential deceased organ donors takes place almost exclusively in intensive care units (ICUs). A negligible percentage of donors are identified in neurology or neurosurgery departments. The key role of anesthesiologists and intensive care unit staff in the organ donation process has prompted consideration of donation indicators in intensive care unit quality systems.

The purpose of this study was to show that indicators related to the process of organ donation are important in evaluation of quality system of intensive care unit.

The following work assessed deceased organ donation indicators and the role of donation-related factors in ICU quality evaluation. This work is only the first step in the quality assessment process – using available data set it was impossible to say whether effective donation procedures indicate higher level of quality of care measured with improved outcomes.

Publication 1: Organ Donation in Intensive Care Units of Hospitals in Warsaw
Karpeta E, Jóźwik A, Małkowski P, Kosieradzki M. Transplantation Proceedings. 2020. DOI: 10.1016/j.transproceed.2020.02.096

A retrospective analysis of the activity of hospitals in deceased donation in 2014-2018 was carried out. The study was conducted in 20 Warsaw hospitals, which were paired groups according to hospital level of reference, patient profile, presence of key departments for identifying and recruiting deceased donors, and the number of beds in intensive care units. We analyzed 330 deaths of patients admitted to the intensive care units of Warsaw hospitals who had eventually been diagnosed with brain death.

Deceased donation activity of intensive care units of Warsaw hospitals from patients diagnosed with brain death was evaluated.

In 2014-2018, we observed a decreasing number of identified donors in ICUs of Warsaw hospitals, parallel to donation rate. Substantial differences in the activity of hospitals with similar profiles and characteristics were seen. Non-pediatric, multi-profile hospitals with level 2 ICUs and those that are also active transplant centres showed higher donation activity.

Publication 2: Healthcare Quality According to ICU Level of Care Karpeta E, Warzyszyńska K, Małkowski P, Kosieradzki M. Health (SCIRP). 2023. DOI: 10.4236/health.2023.1512088

A retrospective study involving records of 12,155 patients hospitalized in 2017-2018 in 16 intensive care units of Warsaw was conducted. Hospitals were divided according to the reference level of intensive care unit into two groups: hospitals with the first ICU level and hospitals with the second ICU reference level. The evaluation of the units was based on a set of 9 safety and quality indicators recommended by the European Society of Intensive Care Medicine (ESICM). Patient demographics, hospital and intensive care unit structure, course of treatment and human resources were analyzed with multivariate ANOVA.

Only minor differences were observed in the quality and efficiency indicators between the first and second reference level ICUs of Warsaw hospitals. Differences were seen in patients' age, comorbidities and crude death rate (higher in the first reference level). Accurate analysis and evaluation of the quality of intensive care units of Warsaw hospitals is hampered by the lack of uniform regional and national medical data registries. Building and systematically implementing quality programs in intensive care is essential. It will not only contribute to optimizing and improving treatment outcomes in Polish ICUs, but also reduce the costs associated with critical care.

Publication 3: Effect of the Organ Donation Quality System on Donation Activity of Warsaw Hospitals Karpeta E, Godlewska I, Małkowski P, Kosieradzki M. Annals of Transplantation. 2024. DOI: 10.12659/AOT.943520

In a study conducted in 15 Warsaw hospitals, divided into two groups (hospitals with and without an organ donation quality system in place), the potential for organ donation was assessed. The results were compared with the quality indicators established by the ODEQUS European Organ Donation Quality System program and the European Commission's Improving Knowledge and Practices in Organ Donation (DOPKI) project. Although hospitals that implemented quality procedures scored higher than hospitals without procedures, the rates in both groups differed significantly from the results described in ODEQUS and DOPKI. Only the rate of

medical disqualification and potential to actual donor conversion, was lower in DOPKI and ODEQUS.

Low number of potential organ donors in Warsaw hospitals is due to inadequate diagnosis of deaths in the mechanism of brain death. High conversion rate raises suspicions, that brain death is diagnosed solely when organ donation is considered. Implementation of protocols and charts that describe various stages of donation process is an effective way to overcome challenges and improve organ donation rates from the deceased.

Conclusions:

This study documents the need to implement quality systems in both organ donation and intensive care. Each stage of an organ donation program, from donor identification through brain death diagnosis, donation authorization, care of the deceased organ donor, organ procurement, and transplantation, requires anesthesiology and intensive care physicians. Intensive care unit is an optimal place to diagnose brain death and provide appropriate medical care for a potential donor.

All intensive care quality systems consider mortality rates. Data from the European Commission state that 3% of patients who die in hospitals and about 15% of patients who die in intensive care units die in a cessation of cerebral blood flow. 42% of people diagnosed with brain death, after ruling out medical contraindications and obtaining authorization for donation, become actual donors. DOPKI program data show that hospitals lacking neurology or neurosurgery departments), diagnose one brain death per ICU bed/365 days. Hospitals with neurology and neurosurgery should achieve higher rates. If the donation potential of Warsaw ICUs was evaluated according to the lowest DOPKI indicators (1 BD/1 ICU bed/1 year), than 318 potential deceased donors should be identified each year in Warsaw alone, and a 133 should become actual donors. The results of analysed 5 years differ significantly from these assumptions. In 2014-2018 percentage of actual donors ranged between 22-40% of the DOPKI indictors.

Modern medicine is based on quality. One of the most important changes in improving healthcare system in Poland, was the enactment, on June 16, 2023, of the Law on Quality in Healthcare and Patient Safety (Journal of Laws 2023, item 1692) [1]. Although the law does not define the concept of quality, it delineates its key

elements, i.e. authorization, internal quality and safety management system, accreditation and medical records. Objective evaluation of organ donation in the context of ICU quality requires analysis of each stage of donation. In Poland, requirements for reference levels of intensive care units were settled, but no coherent quality control system for ICUs with definition of appropriate indicators to enable comparisons, benchmarking and settlement of services with the National Health Fund (NHF) was implemented. There is a need to develop uniform, nationwide guidelines for a hospital quality system for ICUs. According to Donabedian theory, quality systems should include indicators related to three dimensions: structure, process and outcome. The resulting model should be improved according to successive stages, in line with the Deming cycle: plan, do, check, correct (Plan - Do - Check - Act).