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Management of the heart donor after brain death: the role of the nurse

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In Croatia, hearts for transplantation are obtained from donors declared dead according to neurological criteria. The quality of the donor heart depends on optimal donor management. The aim of this paper is to describe the main elements of donor management and the nurse's role in the care of potential heart donors after brain death.

Brain death causes a series of pathophysiological changes that can damage the heart before organ retrieval. Brain injury or cerebral edema increases intracranial pressure, reduces cerebral blood flow and leads to brainstem ischemia. Vagal control of the heart is lost, the sympathetic nervous system is activated, and a catecholamine storm occurs, causing vasoconstriction, tachycardia and hypertension[1,2]. These changes may cause myocardial ischemia: catecholamine-induced tachycardia and hypertension increase myocardial oxygen demand, while coronary vasoconstriction and a shortened diastole reduce oxygen supply. When cerebral ischemia causes the brainstem vasomotor center to cease functioning, vascular tone is lost and hypotension develops. Hypotension reduces coronary perfusion and causes further myocardial injury. Disruption of the blood supply to the hypothalamus and posterior pituitary may impair the release of antidiuretic hormone, resulting in diabetes insipidus with polyuria, hypovolemia and hypernatremia[1,2]. The donor loses large amounts of fluid and electrolytes, compromising hemodynamic stability and cardiac function. Hypothermia is also common because the hypothalamus no longer regulates body temperature. The donor cannot generate heat through shivering, while dilated blood vessels accelerate heat loss. Hypothermia may cause arrhythmias, coagulopathy and hemodynamic instability, further compromising the heart. Ischemic brain tissue releases cytokines into the circulation, triggering a systemic inflammatory response that may damages the heart and other organs. If these pathophysiological changes are not managed promptly, the heart may become unsuitable for transplantation.

Heart donor management is guided by physiological targets. The nurse continuously monitors arterial blood pressure, titrates vasoactive medications according to the physician's orders, monitors hourly urine output, and serum sodium and blood glucose levels. The nurse maintains normothermia, participates in the implementation of lung-protective ventilation, and promptly identifies new abnormalities requiring correction. Donor heart suitability is assessed using echocardiography, together with electrocardiography and troponin levels[3]. The nurse works closely with the transplant coordinator, who provides the recipient center with accurate and up-to-date donor information on which the decision to accept the heart is based. Continuous nursing care aimed at achieving physiological targets following brain death increases the likelihood that the donor heart will be suitable for transplantation[1,2].

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