

# Will implementation of the Life-Sustaining Treatment Decisions Act reduce the incidence of cardiopulmonary resuscitation?

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Although modern medical technologies for life extension has been developed, life-sustaining treatment (LST) could give end-of-life patients extension of what may be a painful and meaningless way of living. The Republic of Korea has established a national management system for LST (Central Hospice Center: September 2017, National Agency for Management of Life-Sustaining Treatment: February 2018), with enactment of the “Act on Hospice and Palliative Care and Decisions on Life-Sustaining Treatment for Patients at the End of Life” (LST Decision Act) [1]. One-third of end-of-life patients made a decision based on medical LST following the implementation of the Act [2].

According to this act, the option to terminate LST is possible in patients at the end-of-life process in Republic of Korea. “End-of-life” refers to a state of imminent death, with no possibility of revitalization or recovery despite treatment with rapidly worsening symptoms, and LST refers to treatment including cardiopulmonary resuscitation (CPR), hemodialysis, chemotherapy, mechanical ventilation, administration of inotropes, extracorporeal life support, and blood transfusion. Especially, CPR can give a prolonged and painful life in the case of end-of-life patients, “do-not-resuscitate” (DNR) orders has been written with consultation of the patient and their family. After implementation of the Act, the physician orders for LST (POLST) also prevent CPR in end-of-life patients. Sometimes the POLST or DNR were documented during the patients were undergoing CPR to stop the meaningless CPR [2].

Did implementation of the Act reduce the incidence of CPR with increasing documented POLST in addition to DNR orders? Im et al. [3] may give us an answer to this question. The retrospective single-center study including adult patients who underwent CPR from February 2016 to January 2020 was performed to compare clinical outcomes following CPR before and after implementation of the Act. Clinical outcomes included the CPR incidence per 1,000 admissions, rate of return of spontaneous circulation (ROSC), duration of CPR, 24-hour survival rate, and survival-to-discharge rate.

The two CPR groups before and after implementation of the Act showed no significant difference in basal characteristics such as age, sex, and Charlson comorbidity index score, and demonstrated no difference in the incidence of CPR per 1,000 admissions. However, CPR cases post-implementation showed an increased ROSC rate ( $P=0.008$ ) and survival-to-discharge rate ( $P=0.029$ ). If the implementation of this Act can lead to a decrease in the incidence of CPR, this

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might mean that end-of-life patients and their families had a high tendency not to stop LST before its implementation. Nevertheless, the CPR incidence was not affected by the implementation of the Act. This may indicate that the physicians also actively made documented or verbal DNR orders on consultation with end-of-life patients and their families before the Act was implemented [3]. Before the Act was implemented, the rate of CPR due to delayed documentation of POLST or DNR was 6%–7% of CPR cases, with no difference after implementation. However, the CPR rate with documentation of POLST or DNR decreased after implementation. Therefore, delayed documentation of POLST or DNR seemed not to have a major role in incidence of CPR.

When examining the total number of patients who were hospitalized, there was no significant difference in in-hospital mortality before and after implementation of the act, but the rate of documented POLST or DNR orders increased abruptly from 260 to 1,399. In contrast, CPR cases after implementation of the Act less often had documented POLST or DNR orders than those before implementation. This means that the physicians and the patients' families thought that the patients undergoing CPR were not hopeless and did not rush to create documented POLST or DNR orders during CPR. This was supported by the fact that the ROSC and CPR survival rates improved after implementation of the Act [3]. We could assume that the proportion of end-of-life patients increased but they did not experience CPR because they agreed to POLST/DNR documentation before CPR.

Another retrospective single-center study of patients with cancer who died in hospital showed that DNR or POLST documentation rates after the implementation of the Act increased significantly from 75.6% to 87.0% ( $P < 0.001$ ), and DNR or POLST documentation within 7 days of death after implementation decreased from 56.2% to 47.6% ( $P < 0.001$ ) compared to before [4]. In the study by Im et al. [3], inpatient death with documentation of DNR or POLST increased dramatically, and the rate of DNR orders or POLST written on the day of death also increased from 32% to 45%. This is too short a time to make a decision about stopping LST with full consultation with the patient and family to reflect the patient's will [5]. The hospital system should be improved so that consultations with patients and their families can begin as soon as possible

and there is sufficient time to communicate to ensure that the POLST is documented to reflect the patient's wishes.

A major limitation of the study by Im et al. [3] is that it is a single-center study. Future nationwide studies with long-term observation will be necessary to evaluate the full effect of this Act. However, study by Im et al. [3] was very impressive, showing how the implementation of the LST Decision Act affected outcomes of CPR first in the Republic of Korea.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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