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Nature of care in Intensive Care Unit at King Chulalongkorn Memorial Hospital

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Introduction : *Only recently that chronic diseases have been found increasing due to longer life spans of human beings. Meanwhile, the development of medical technology has been saving many lives. Nevertheless, it also artificially prolongs the lives terminal patients. In actual situations, there have been widely scarce of ICU cares or negative balance in demand and supply of ICU cares. A cause of the scarcity might be unintentional provision of ICU for caring at the end of life. However, there has been no investigation on the nature of care in ICUs of King Chulalongkorn Memorial Hospital. The authors considered if there have been data regarding the nature of cares in term of resource allocation in intensive care units, it would be useful for future ICU management*

Objectives : *(1) To explore lengths of stay in ICU of King Chulalongkorn Memorial Hospital;*

(2) To explore proportions in term of number and time consumption of non-survivors and survivors in ICU of King Chulalongkorn Memorial Hospital.

Research design : *A retrospective study.*

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Patients : *The target of population survey is adult patients (age>15 years) who were admitted in ICUs at King Chulalongkorn Memorial Hospital from January to December, 2007.*

Methods : *Data were collected in term of numbers of the target population based on the formal records from the department of registration and reviewed ICU medical records. Then, number of the target group, i.e., survivors, and non-survivors were counted. The length of stay (LOS) in ICU of the patients, underlying conditions, medical treatment and demographic data of both groups of patients were categorized and recorded in numbers. Descriptive statistics: percentage was used for numerical and categorical variables; mean and standard deviation were used for length of stay in ICU. As for inferential statistics, Chi-square was used for comparison between the survivors and non-survivors.*

Results : *Total target population was 2,828 patients. Three hundred and eleven patients died and the overall mortality rate was 10.99%. As for the overall admissions, the longer average LOS groups were in MED1 ICU (160.27 ± 259.28 hr.). The shortest average LOS was in Obstetrics and Gynecological ICU (40.95 ± 47.46 hr). Overall the proportion of time consumption of the survivors and non-survivors were 3:1. The overall proportion of number of survivors and non- survivors were 9:1. There have been differences of these proportions among different types of ICU. The proportions of number of survivors and non-survivors of MED1 and 2 ICU were 1.74:1 and 0.98:1 respectively.*

Discussion : *The overall proportion of number of survivors and non-survivors of 9:1 indicated the nature of ICU cares at King Chulalongkorn Hospital were not spent as places for patients at the end of lives. However, there has been an earlier study in the US that 1 in 5 patients did not survived in some intensive cares. These might possibly imply that the intensive care units would become places for patients at the end of lives in the near future. The main findings from this study showed that the medical ICUs tended to be places for caring patients at the end of lives. Other findings such as CPR action or the very short period of admission, might imply lack of end-of-life care application*

Conclusion : *The research question whether the ICUs are places for caring patients at the end of lives was replied. That was ICUs at King Chulalongkorn Memorial Hospital were normally not allocated for those who at the end of lives. Because the overall proportion of number of survivors and non-survivors was less than of the western report and the overall time consumption of survivors was higher than of non-survivors. However, the medical ICUs tended to be places for caring patients at the end of lives. Some remarkable findings implied some problems of decision makings regarding end-of-life care that might lead ICUs to be places for caring patients at the end of lives. The in-depth study should be further investigated*

Keywords : *Cause of death, Intensive care unit, Length of stay, Non-survivor and survivor.*

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บทนำ : *ปัจจุบันประชากรมีอายุยืนยาวและมีแนวโน้มเจ็บป่วยด้วยโรคเรื้อรังมากขึ้น ซึ่งอาจเกิดจากการพัฒนาเทคโนโลยีทางการแพทย์ที่ก้าวหน้าช่วยยืดชีวิตให้ผู้ป่วยได้ และอาจทำให้ต้องรักษาในหออภิบาลผู้ป่วยหนักเป็นเวลานานขึ้น รวมทั้งการที่มีประเด็นทางสังคมที่มักวิพากษ์วิจารณ์เกี่ยวกับการใช้ทรัพยากรในหออภิบาลหนักอย่างไม่คุ้มค่า โดยเฉพาะกลุ่มความหวังน้อยมากในการรอดชีวิต ทำให้ผู้ป่วยหลายรายที่มีความจำเป็นแต่ต้องขาดโอกาสได้รับการรักษาในหออภิบาลผู้ป่วยหนัก เนื่องจากจำนวนเตียงไม่เพียงพอ ประกอบกับทางโรงพยาบาลจุฬาลงกรณ์ยังไม่มีข้อมูลที่แน่ชัดเกี่ยวกับการใช้ทรัพยากรหออภิบาลผู้ป่วยหนักในด้านการใช้เป็นสถานที่ดูแลรักษาภาวะวิกฤติ หรือเป็นที่ดูแลผู้ป่วยระยะจุดสุดท้ายของชีวิต ซึ่งถ้าหากมีการรวบรวมข้อมูลเพื่อแสดงให้เห็นภาพของการใช้ทรัพยากรในหออภิบาลผู้ป่วยหนัก จึงน่าจะมีประโยชน์ต่อการบริหารจัดการทรัพยากรในอนาคตได้*

วัตถุประสงค์ : *1. ศึกษาหาระยะเวลาของการครองเตียงในหออภิบาลผู้ป่วยหนักในโรงพยาบาลจุฬาลงกรณ์*

2. คำนวณหาจำนวนและระยะเวลาครองเตียงของผู้ป่วยที่รอดชีวิตเป็นสัดส่วนเท่าไหร่ของผู้ป่วยที่เสียชีวิตจาก การเข้ารับการรักษาในหออภิบาลผู้ป่วยหนักของโรงพยาบาลจุฬาลงกรณ์

รูปแบบการวิจัย : การศึกษาย้อนหลังเชิงพรรณนา

ผู้ป่วยที่ได้ทำการศึกษา : *ใน ผู้ป่วยที่มีอายุตั้งแต่ 15 ปีที่เข้ารับการรักษาในหออภิบาลผู้ป่วยหนักโรงพยาบาลจุฬาลงกรณ์ ตั้งแต่ 1 ม.ค. 2550-31 ธ.ค. 2550*

วิธีการศึกษา : *โดยรวบรวมข้อมูลจากทั้งหน่วยเวชทะเบียนและข้อมูลที่บันทึกในระบบเก็บข้อมูลของ โรงพยาบาล โดยได้มีการแบ่งผู้ป่วยที่ต้องการศึกษาเป็น 2 กลุ่ม คือ กลุ่มที่รอดชีวิต และกลุ่มที่เสียชีวิตในหออภิบาลผู้ป่วยหนักทั้ง 7 แห่ง โดยเก็บรวบรวมข้อมูลเกี่ยวกับจำนวนผู้ป่วยแต่ละหออภิบาลผู้ป่วยหนัก อัตราการครองเตียงและการครองเตียงเฉลี่ยของแต่ละหออภิบาลผู้ป่วยหนัก อัตราการเสียชีวิตในหออภิบาลผู้ป่วยหนัก โรคประจำตัว การรักษา และข้อมูลพื้นฐานของผู้ป่วยทั้ง 2 กลุ่ม นำมาวิเคราะห์เปรียบเทียบกัน*

ผลการศึกษา : *ผู้ป่วยที่ทำการศึกษาทั้งหมด 2,828 คน มีผู้ที่เสียชีวิตขณะรักษาในหออภิบาลผู้ป่วยหนักคิดเป็น 10.99% โดยพบว่าผู้ป่วยในแผนกอายุรกรรมมีอัตราการครองเตียงนานที่สุด (160.27±259.28 ชั่วโมง) และต่ำสุดที่แผนกสูตินรีเวชกรรม (40.95±47.46 ชั่วโมง) สัดส่วนโดยรวมของผู้รอดชีวิตต่อผู้เสียชีวิตเป็น 9:1 และอัตราการครองเตียงของผู้ป่วยที่รอดชีวิตต่อผู้ป่วยที่เสียชีวิตในหออภิบาลผู้ป่วยหนักเป็น 3:1 โดยแต่ละหออภิบาลผู้ป่วยหนักมีความแตกต่างกันสูงสุดที่แผนกอายุรกรรม และต่ำสุดที่แผนกสูตินรี-เวชกรรม ข้อมูลพื้นฐานมีความแตกต่างกันอย่างมีนัยสำคัญ ในเรื่องอายุ โดยจะพบว่าในกลุ่มที่เสียชีวิตในหออภิบาลผู้ป่วยหนักจะมีอายุสูงกว่าผู้รอดชีวิต*

บทวิจารณ์ : *สัดส่วนโดยรวมของผู้รอดชีวิตต่อผู้เสียชีวิตเป็น 9:1 บ่งชี้ว่าธรรมชาติของการดูแลในหออภิบาลผู้ป่วยหนักไม่ได้เป็นการดูแลผู้ป่วยระยะจุดสุดท้ายของชีวิต ซึ่งหากเทียบเคียงกับการศึกษาก่อนหน้านี้ในประเทศสหรัฐอเมริกาที่พบว่า สัดส่วนดังกล่าวมีค่าประมาณ 5:1 อย่างไรก็ตามมีแนวโน้มว่าหออภิบาลผู้ป่วยอาจกลายเป็นสถานที่ดูแลผู้ป่วยระยะจุดสุดท้ายของชีวิตในอนาคตอันใกล้ โดยจะเห็นได้จาก สัดส่วนของผู้รอดชีวิตต่อผู้เสียชีวิตของหออภิบาลผู้ป่วยกลุ่มอายุรกรรมค่อนข้างน้อยรวมทั้งผลการศึกษาอื่นที่พบ เช่น การทำการกู้ชีวิต หรือระยะเวลาครองเตียงที่สั้นมาก ที่อาจบ่งถึงการขาดแนวทางการดูแลระยะสุดท้ายของชีวิต*

บทสรุป : *คำถามการวิจัยที่ว่า การดูแลรักษาในหออภิบาลผู้ป่วยหนักในโรงพยาบาลจุฬาลงกรณ์ เป็นไปเพื่อการดูแลผู้ป่วยวิกฤติ หรือเป็นไปเพื่อการดูแลผู้ป่วยระยะจุดสุดท้ายของชีวิต ได้รับการตอบจากการศึกษาวิจัยนี้ว่าหากพิจารณาในภาพรวม การดูแลรักษาในหออภิบาลผู้ป่วยหนักไม่ได้เป็นไปในทางที่ดูแลผู้ป่วยระยะจุดสุดท้าย เนื่องจากสัดส่วนของผู้รอดชีวิตต่อผู้เสียชีวิตน้อยกว่าการศึกษาในต่างประเทศ อีกทั้งระยะเวลาครองเตียงของผู้รอดชีวิตมากกว่าผู้เสียชีวิต อย่างไรก็ตามพบว่าหออภิบาลผู้ป่วยหนักกลุ่มอายุรกรรมมีแนวโน้มที่จะไปในทางการดูแลผู้ป่วยระยะจุดสุดท้ายของชีวิต ผลการศึกษาอื่นๆ อาจนำไปสู่การนำการดูแลระยะสุดท้ายของชีวิตมาประยุกต์ใช้ รวมทั้งควรมีการศึกษาเชิงลึกเพิ่มเติม*

คำสำคัญ : *รอดชีวิต, เสียชีวิต, เหตุการตาย, หออภิบาลผู้ป่วยหนัก.*

Only recently there has been an increase in people life expectancy. Based on WHO reports, expected life span of people will be over 65 years in 2020 and will be approximately increased to 82%.[1] Consequently, the survival of patients with chronic diseases would be found increasing due to the lengthening of the human life spans.[2-4] Meanwhile, the development of medical technology directly contributes to life-saving procedures. For examples, hemodialysis is a machine that has radically prolonged lives of patients with chronic renal failure; mechanical ventilation supports patients with curable respiratory failure so that they survive.[5]

Nevertheless, these technologies not only support the lives in critical periods but also they have prolonged the lives of the terminally ill patients.[6-7] A study in the United States found that as much as 1 in 5 of patients died in intensive care unit (ICU).[8] Unfortunately, those patients who died in ICU most likely were separated from their beloved ones. These situations seem to be less humanity regarded in the end-of-life care.[9-10] Moreover, ICUs should be the places for intensive treatments, and not for end-of-life cares.[11]

In actual situations, there have been widely scarcity of ICU cares or negative balance in demand and supply of ICU cares. King Chulalongkorn Memorial Hospital (KCMH) with the capacity of 49 ICU cares for critical patients reported that the incidence of postponing surgical operations caused by inadequate post-ICU care was approximately 7.7 percent of the total postponed surgical operations.[12] A cause of the problem might be unintentional provision of ICU cares for end-of-life cares. However, there has no investigation about the nature of care in ICUs of King Chulalongkorn Memorial Hospital.

Therefore, the main objectives of this study are to explore the proportions of survivors and non-survivors in ICU care, ICU time consumption for survivors and non-survivors care, the lengths of stay in ICU cares and events in ICU in order to primarily reveal the tendency of ICU cares, whether it serves for intensive or at the end-of life care.

Materials and Methods

This study is a retrospective study. The target of population survey is adult patients (age>15 years) who were admitted in ICUs at King Chulalongkorn Memorial Hospital from January to December, 2007. There are seven ICUs for caring adult patients at King Chulalongkorn Memorial Hospital, which are the 1st General Medicine intensive care unit (MED1), the 2nd general medicine intensive care unit (MED2), cardiac medical intensive care unit (CCU), surgical intensive care unit (SURG), cardiothoracic and vascular intensive care unit (CVT), neurological intensive care unit (NEURO), and obstetrics and gynecological intensive care unit (OB/GYN).

In order to avoid any missing of data, the researchers collected the numbers of the target population based on the formal records from the Department of Registration and reviewed ICU medical records of all patients who were admitted from January to December, 2007. All medical records were thoroughly reviewed in order to completely fill up the research forms. The required data were: date and time of admission and departure for those who were discharged from ICU, i.e. the 'survivors', their underlying conditions, medical treatments and medical courses in ICUs, ICD10 which lists the causes

of death for those who died in ICU, i.e., the 'non-survivors', and their demographic data.

Then, number of the target group, survivors, and non-survivors were counted. The length of stay (LOS) in ICU was summarized in minutes. The underlying conditions, medical treatments, demographic data were categorized into survivor and non-survivor groups, and recorded in numbers. Proportions of number and ICU time consumption between survivors and non-survivors were calculated from the primary data.

Descriptive statistics: percentage was used for numerical and categorical variables; mean and standard deviation were used for lengths of stay in ICU. As for inferential statistics, Chi-square was used for comparison between survivors and non-survivors.

Results

Total target population was 2,828 patients. Three hundred and eleven (311) patients were dead and the overall mortality rate was 10.99%. Proportions in number of survivor and non-survivor among types of ICU were different. Two medical intensive care units seemed to have less proportion of survivors than the others. The high proportions of survivor were of CCU and OB/GYN ICU (Table 1).

Table 1. Total patients admitted in ICUs at King Chulalongkorn Memorial Hospital during 1 year (January-December, 2007).

ICUs	Total patients (n=2,828)	Non-survivors (n=311)	Survivors (n=2,517)	Proportion of Survivor/Non-survivor
MED1	266	97 (31.19)	169 (6.71)	1.74: 1
MED2	222	112 (36.01)	110 (4.37)	0.98: 1
CCU	384	3 (0.97)	381 (15.14)	127: 1
SUR	455	34 (10.93)	421 (16.73)	12.4: 1
CVT	484	34 (10.93)	450 (17.88)	13.2: 1
NEURO	614	27 (8.68)	587 (23.32)	21.7: 1
OB/GYN	403	4 (1.29)	399 (15.85)	99.7: 1
Total				8.1: 1

MED1 = 1st General Medicine intensive care unit

MED2 = 2nd General Medicine intensive care unit

CCU = Cardiac Medical intensive care unit

SURG = Surgical intensive care unit

CVT = Cardiothoracic and Vascular intensive care unit

NEURO = Neurologic intensive care unit

OB/GYN = Obstetric and Gynecologic intensive care unit

Numbers in parenthesis are percentage

Regarding the lengths of stay of the overall admissions, the longest average LOS groups were seen in MED1 ICU, followed by MED2 ICU (Table 2). The shortest average LOS was seen in Obstetrics and Gynecology ICU (40.95 ± 47.46 hr.). There were 6 admissions that consumed only 1 hour, and 5 in 6 patients were dead.

As for the non-survival group, their average LOS in ICU was 189.20 ± 290.73 hours, which was longer than that of the survival group (68.10 ± 109.84). The average LOS in CVT ICU and SURG ICU of the non-survivors was longer than in the two Medical ICUs (Table 2). The longest time consumption for the non-survival group was 2,886 hours or about 121 days.

As for the survival group, the average LOS in MED1 and MED2 ICUs were longer than the others, in which the average LOS in Medical Intensive Care Units were 130.11 ± 161.46 and 119.25 ± 161.46 hours. The minimum LOS in the survival group was less than 4 hours in 4 from 7 ICUs (Table 2).

To derive ICU time consumptions of survivors and non-survivors in a year, ICU time available has to be calculated by the total number of ICU beds multiplied with 24 (hours) and 365 (days). The calculated ICU time available was 429,240 hours. Overall non-survivors and survivors time consumptions were 58,841 and 171,420 hours, respectively. Percentages of time spend in time available of these two groups were 13.70% and 39.89%, respectively. The proportion of time consumption of non-survivors and survivors were 1:3 (Table 3).

Table 2. Length of stay (LOS) in ICUs.

ICUs	Total patients (n = 2,828) LOS in ICU (hr)			Non-survivor (n = 311) LOS in ICU (hr)			Survivor (n = 2,517) LOS in ICU (hr)		
	Mean ± SD	min	max	Mean ± SD	min	max	Mean ± SD	Min	max
MED1	160.27 ± 259.28	1	2,886	212.81 ± 368.18	1	2,886	130.11 ± 161.46	4	957
MED2	128.11 ± 178.91	1	1,115	136.80 ± 175.24	1	926	119.25 ±182.95	6	1,115
CCU	75.59 ± 70.26	2	715	181.00 ± 133.13	39	303	74.76 ± 69.24	2	715
SURG	86.38 ± 177.10	1	2,281	256.74 ± 369.95	1	1,607	72.62 ± 143.56	1	2,281
CVT	75.94 ± 146.96	3	1,344	325.74 ± 329.30	15	1,344	57.06 ± 100.89	3	1,228
NEURO	61.24 ± 91.86	6	1,120	80.85 ± 58.91	12	237	60.34 ± 93.03	6	1,120
OB/GYN	40.95 ± 47.46	2	425	86.50 ± 128.57	2	277	40.50 ± 46.15	2	425
Total	81.42 ± 146.43	1	2,886	189.20 ± 290.73	1	2,886	68.10 ± 109.84	1	2,281

Table 3. Proportion of ICU time-consumption of non-survivors and survivors.

	Non-survivors (n = 311) LOS in ICU (hours)	**Survivors (n = 2,517) LOS in ICU (hours)**
Total ICU time-consumption in 1 year (hours)	58841 (13.70%)	171420 (39.89%)
Proportion of Survivors and Non-survivors	2.91: 1	

Demographic data: age, gender, ICU events and underlying conditions were recorded and differentiated in non-survivor and survivor groups (Table 4). Age, gender and numbers of chronic conditions were not significantly different between the two groups. ICU events were significantly different in postoperative care, hemodialysis usage, mechanical ventilator usage, cardiopulmonary resuscitation (CPR) performing. There seemed to be more survivors (73.94%) than non-survivors (33.76%) for those patients who received ICU care for postoperative period. Among those who received hemodialysis, mechanical ventilation and CPR, there were more non-survivors than survivors. As for underlying conditions, congestive heart failure, sepsis, diabetes, chronic obstructive pulmonary disease, renal failure, liver disease, cerebrovascular accident and cancer were statistically significantly higher in number in non-survivors than survivors. However, hypertension was statistically higher in number in survivors than non-survivors (Table 4).

Table 4. Characteristics of non-survivors and survivors in ICU care.

Characteristics	**Non-survivor (n = 311)**	**Survivor (n = 2,517)**	***P*-value**
Mean ± SD age (y)	62.01 ± 18.12	56.88 ± 18.54	<0.001
Age group (number)			
15-44	52 (16.72%)	658 (26.14%)	1.000
45-54	43 (13.83%)	372 (14.78%)	1.000
55-64	59 (18.97%)	466 (18.51%)	1.000
65-74	69 (22.19%)	536 (21.30%)	1.000
75-84	68 (21.86%)	402 (15.97%)	1.000
≥85	20 (6.43%)	83 (3.30%)	1.000
Sex			
Male	179 (57.56%)	1,197 (47.56%)	1.000
Female	132 (42.44%)	1,320 (52.44%)	1.000
Postoperation (number)	105 (33.76%)	1,861 (73.94%)	<0.001
Hemodialysis (number)	111 (35.69%)	81 (3.22%)	<0.001
Mechanical Ventilation (number)	309 (99.36%)	739 (29.36%)	<0.001
CPR	123 (39.55%)	19 (0.75%)	<0.001
No. of chronic conditions			
‘0	9 (2.89%)	775 (30.79%)	1.000
1-2	168 (54.02%)	1,243 (49.38%)	1.000
3-4	120 (38.59%)	477 (18.95%)	1.000
≥5	14 (4.50%)	22 (0.87%)	1.000

Table 4. Continued.

Characteristics	Non-survivor (n = 311)	Survivor (n = 2,517)	*P*-value
Underlying conditions (number)			
- Acute myocardial infarction	16 (5.14%)	143 (5.68%)	0.698
- Ischemic heart disease	52 (16.72%)	468 (18.59%)	0.360
- Hypertension	18 (5.79%)	908 (36.07%)	<0.001
- Congestive heart failure	30 (9.65%)	150 (5.96%)	1.012
- Trauma	15 (4.82%)	135 (5.36%)	0.688
- Sepsis	134 (43.09%)	53 (2.11%)	<0.001
- Diabetic mellitus	80 (25.72%)	574 (22.80%)	0.292
- Chronic obstructive pulmonary disease	16 (5.14%)	46 (1.83%)	<0.001
- Renal failure	155 (49.84%)	172 (6.83%)	<0.001
- Liver disease	64 (20.58%)	93 (3.69%)	<0.001
- Cerebrovascular disease	55 (17.68%)	155 (6.16%)	<0.001
- Cancer	97 (31.19%)	511 (20.30%)	<0.001

Numbers in parametric were percentage. For inferential statistics, Chi-square was used for numberical variable ; Mann Whisney U test was used mean ICU LOS (length of stay); T-test was used for Mean age.

Interesting data was that CPR was performed about 39.55% in the non-survival group. The total number of CPR performed was 142 patients; 12.83% were performed on survivors and 87.17% were performed on non-survivors (Table 4). Some patients needed ICU care several times. Readmissions of patients were counted; they were about 10% of the total patients.

Discussion

This study has found that the total number of patients who died in ICUs were 311 of 2,828 of the total ICU-admitted patients (1 in 9 or 10.99%). An earlier study done in the US reported that 1 in 5 patients did not survived in some intensive care units.[1] Moreover, ICU time consumptions of survivors and non-survivors were about 3:1. This means that 25% of ICU time spend was for end-of-life care. These findings might lead to a conclusion that the intensive care units at King Chulalongkorn Memorial Hospital practically were not for caring at the end of life.

However, differences in ICUs lead to differences in the natures of cares. This study has found that medical intensive care units have tendencies to be facilities for caring at the end of life. On the contrary, the CCU-cardiac medical care tends to be the highest survivors and non-survivors ratio. Major roles in these differences are possibly contributed by conditions of patients and ICU admission arrangement. As for patients who received continuous care, it is possible that physicians made good decisions at the time of Medical ICUs admission

and all physicians expected that patients would survive. Inevitable, the medical intensive cares are provided for patients who have multiple-organ dysfunctions and these patients need intensive and high technology supportive cares.

Remarkably, this study has found that 6 patients were cared in ICUs less than 1 hour and most of them died. It was possible that physicians who were in charge predicted that these patients were terminally ill, however; the physicians gave them a chance of intensive treatments. On the contrary, a question could be raised whether or not the intensive care units of the hospital provide ineffective care. Moreover, whether or not the patient who was admitted in the surgical intensive care less than 1 hour was from inappropriate decision-making for ICU admission. Thus, ICU admission arrangement should be concerned with these questions and have them reviewed.

Length of stay in intensive cares not only leads us to know how long of a patient needs care in different types of ICUs but also to know ICU time consumptions. ICU time consumption of a patient is one of the useful data for ICU demand-supply management. As for LOS, nature of patients who were admitted in the medical intensive care units usually had chronic illnesses so that they needed longer ICU care than those in other ICUs. However, ICU time consumptions of the non-survivor in the medical ICUs were 1-2 of ICU time consumptions of the survivor. Thus, comparing between medical ICUs in other hospitals should be investigated in order to know proper resource management. In this study, we have found that if a patient was cared in ICUs more than 7 days, it is most likely that this patient would not survive.

As for underlying diseases, non-survivors in ICUs were associated with renal failure, hemodialysis and sepsis, but not hypertension and ischemic heart disease. There might be two reasons behind this. Firstly, there were effective cardiac team cares. Secondly, these cardiac patients did not have other organ dysfunctions.

Unsurprisingly, cardiopulmonary resuscitations (CPR) were performed in the non-survival group more than the survival group. Regarding the total number of CPR, 87.17% of CPR was performed on non-survivors. These CPR were questionable for the suitability or proper decision making of the physician. This might reflect that the nature of care at the end of life interpreted by the hospital staff. However, this study could not reveal the dimensions of patients who were receiving palliative care. Therefore, further studies of end-of-life cares in ICU should be performed.

This study was designed as a quantitative study. Therefore, it does not include the aspects of socio-cultural involvement. The results that indicated the medical ICUs had tendencies to be places for end-of-life cares might be caused by some cultural values such as medical personnel and relatives' preferences of treatments in ICUs, i.e. valuing ICU care as the best care. [6,7]

This study also has several limitations. First, the results of this study are based on number of patients not on the number of ICU admission. Of course, there were patients who were admitted to ICUs more than once. If the design of study was to collect data based on the number of ICU admissions, there would be misinterpretation regarding the results of underlying diseases. But, this study was designed as

data collection, based on the number of patients; it would have less episodes than the actual situation in data corresponding to the survival groups. Therefore, we can interpret the presented proportions of number and time consumption of non-survivors and survivors which confirms that King Chulalongkorn Memorial Hospital's ICU cares are practically not for patients at the end of lives.

Secondly, this study was designed variables to know whether ICU care for intensive or at the end of lives. care were proportions of number and ICU time consumption of non-survival and survival groups, whereas these variables can represent some parts of the study's objective. However, the results of this study can reveal the practical types of ICU cares in general. To reveal in details, it should have further prospective studies.

As for other limitations, since this study was a retrospective study, the presented underlying diseases could not be collected under the same definitions. Moreover, we could not know that theses co-morbid conditions that occurred before or after the ICU admissions.

Conclusion

This study shows that the overall proportion of number of survivors and non-survivors at King Chulalongkorn Memorial Hospital's seven adult ICUs is 9:1 and the overall proportion of ICU time-consumption of survivors and non-survivors is 3:1. These might summarize that ICU cares are practically not ICUs for caring at the end of life. However, the Medical ICUs have tendencies to care for non-survivors than survivors. Some remarkable findings implied some problems of decision makings regarding end of life care that might lead ICUs to be places for caring patients at the end of live. The in-depth study should be further investigated.

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