

Situation Analysis of Emergency Department of the Japanese Acute Care Hospitals

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Abstract

We have conducted the situation analysis of emergency division of the DPC based acute care hospitals during 1st and 31st October 2006. The studied hospitals were 180 facilities that contracted with our research team for this study. Each participant hospital was required to register the patients who used the emergency division during 1st to 31st October 2006. We differentiated the cases into three types; primary case, secondary case and tertiary case. Furthermore, we distinguished the hospitals into two types; with and without emergency care centers. Based on this dataset, we have conducted the descriptive analyses concerning the patient type and primary diagnosis of tertiary patients. Contrary to the governmental policy for organization of emergency services, although the facilities with the emergency care center accepted more tertiary cases (88.8 cases per month v.s 32.6; 15.8% vs 4.2%), primary cases represented about 70% as like as facilities without emergency care center. There were little differences in the disease structures of accepted patients between both types. Cerebro-vascular diseases (i.e., cerebral infarction, cerebral hemorrhage, SAH), ischemic heart diseases (AMI and angina pectoris), poisoning, hip and pelvic fractures, pneumonia were common diseases and injuries. In order to realize a balanced emergency care system, the governance power of Regional Health Care Plan must be strengthened.

Key words: DPC, regional health care plan, emergency care

❖ Introduction

As other developed countries, the Japanese government has introduced the casemix based evaluation

system for the acute care hospitals since 2003¹⁾. The used casemix system is DPC (Diagnostic Procedures Combination) that was newly developed by our research team¹⁾.

The DPC based payment for hospitals composes of 2 components; DPC component and Fee-For-Service component. The DPC component corresponds to the “so called” hospital fee and the FFS component corresponds to tariffs for “so called” doctor fee, i.e.,

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Table 1 Distribution of patient types both for facilities with the emergency care center and those without such centers (1st to 31st October, 2008)

		Primary case	Secondary case	Tertiary case	Total
Number	Designated emergency center	1268.2	221.2	88.8	1578.2
	Other facility	729	137.7	32.6	899.3
%	Designated emergency center	68.9	15.3	15.8	100
	Other facility	75.8	20	4.2	100

surgical procedures and anesthesia. For the DPC component, per diem payment schedule is set for each DPC group.

In the case of emergency cases, the payment is arranged as an additional per-diem payment. However, it is generally perceived that the current amount of reimbursement for emergency care is quite insufficient. There is a critic that the DPC based bundle type of payment may aggravate the economic evaluation of emergency services. The Ministry of Health, Labor and Welfare (MHLW) has suggested to set some coefficients in order to financially evaluate the specific function of acute care hospitals such as emergency care, nurse staffing, training of residents, etc. At the moment, however, there is little information how much the emergency care does cost.

In order to construct the scheme that appropriately evaluates the workload of emergency care, the authors have conducted the situation analysis of emergency division of the DPC based acute care hospitals during 1st and 31st October 2006.

❖ Population and Methods

The studied hospitals were 180 facilities. These hospitals participated to the governmental DPC study in 2006 and contracted with our research team for the additional research for emergency care. Each participant hospital was required to register the patients who used the emergency division during 1st to 31st October 2006. We differentiated the cases into 3 types; primary case, secondary case and tertiary case. The primary case is a patient who receives only out-patient services and return to home after the treatment. The secondary case is a patient who hospitalized in general ward but not required any intensive cares. The tertiary case is a patient who required intensive cares in the specific wards. In the case of tertiary case, the following information is required to register; age, sex, pri-

mary diagnosis, APACHE II score, outcome at discharge, existence of DOA (dead on arrival), date of admission, date of discharge.

Based on this dataset, we have conducted the descriptive analyses concerning the patient type and primary diagnosis of tertiary patients. Because of low quality of APACHE data, we did not use this information for the present analysis. Statistical analyses were conducted using IBM SPSS version 19.0 (IBM SPSS, Armonk, NY, USA).

Study approval was obtained from the Institutional Review Boards and the Ethics Committee of University of Occupational and Environmental Health, Japan. Given the anonymous nature of the data collection process, informed consent was not required.

❖ Results

Table 1 showed the distribution of patient types both for facilities with the emergency care center and those without such centers. Although the facilities with the emergency care center accepted more tertiary cases (88.8 cases per month v.s 32.6; 15.8% vs 4.2%), primary cases represented about 70% for both facilities (1268.2 cases vs 729.0; 68.9% vs 75.8%).

Table 2 showed the top 15 primary diagnosis of tertiary patients decomposed by type of emergency division. There were little differences in the disease structures of accepted patients. Cerebro-vascular diseases (i.e., cerebral infarction, cerebral hemorrhage, SAH), ischemic heart diseases (AMI and angina pectoris), poisoning, hip and pelvic fractures, pneumonia were common diseases and injuries for both facilities. The cases of cardiac arrest showed higher percentage for facilities with the emergency care center.

Table 3 showed the top 15 primary diagnosis of tertiary patients by age category. In the case of patients less than 15 years old, acute infectious diseases (i.e.,

Table 2 Top 15 primary diagnosis of tertiary patients according to the type of emergency division (1st to 31st October, 2008)

	ICD	Diagnosis	N	%	Cum %
Emergency center	I63	Cerebral infarction	295	5.5	5.5
	I61	Cerebral bleeding	291	5.4	10.9
	S06	Intracranial injury	245	4.6	15.5
	I21	AMI	241	4.5	20
	I46	Cardiac arrest	236	4.4	24.4
	I50	Heart failure	187	3.5	27.9
	T50	Poisoning	165	3.1	30.9
	I60	SAH	140	2.6	33.6
	J18	Pneumonia	111	2.1	35.6
	I20	Angina pectoris	104	1.9	37.6
	K56	Ileus	89	1.7	39.2
	S72	Hip fracture	83	1.5	40.8
	I71	Aortic aneurysm	82	1.5	42.3
	S32	Pelvic fracture	78	1.5	43.7
K25	Gastric ulcer	76	1.4	45.2	
Other than Emergency center	I63	Cerebral infarction	364	5.5	5.5
	I21	AMI	306	4.7	10.2
	I61	Cerebral bleeding	257	3.9	14.1
	I50	Poisoning	222	3.4	17.5
	A09	Diarrhea, gastritis	203	3.1	20.6
	J18	Pneumonia	163	2.5	23
	I20	Angina pectoris	157	2.4	25.4
	I60	SAH	145	2.2	27.6
	S06	Intracranial injury	142	2.2	29.8
	S72	Hip fracture	117	1.8	31.6
	K56	Ileus	114	1.7	33.3
	J02	Acute pharyngitis	112	1.7	35
	K92	Hematemesis	106	1.6	36.6
	I46	Cardiac arrest	94	1.4	38
	I71	Aortic aneurysm	88	1.3	39.4

acute entero-gastritis, diarrhea, acute pharyngitis, pneumonia, acute bronchitis, acute appendicitis), asthma and febrile convulsion were main diagnoses. For the cases between 15 and 39 years old, the variety of diagnoses widened. In addition to acute infectious diseases, poisoning, obstetric disorder and injuries became main diagnoses. For the cases more than 40 years old, cerebro-vascular diseases and cardiac diseases became main diagnosis. These two categories of diseases represented for about 30% of total cases.

◆ Discussion

This study has clarified the following important finding about the Japanese emergency care. The governmental policy tries to differentiate the emergency

facilities into the following three types; tertiary facility (facilities with highly specialized emergency center), secondary facility (facilities with emergency center) and primary facility (facilities without emergency center)²⁾. The primary facility is usually an acute care hospital or clinic. They are expected to respond to walk-in cases without severe diseases and injuries. It is very common that medical facilities in the community take this responsibility in turn by organizing a network. The secondary facility is an acute care hospital with emergency care services. They can treat wide ranges of diseases and injuries, including cerebro-vascular diseases, cardio-vascular diseases, injuries, poisoning, pneumonia, pediatrics cases and so on. The tertiary facility is an acute care hospital with specialized emergency care services. Usually

Table 3 Top 15 primary diagnosis of tertiary patients according to the type of emergency division (1st to 31st October, 2008)

ICD	Diagnosis	Under 15 y.o.		
		N	%	Cum %
A09	Acute entero-gastritis, diarrhea	139	10.2%	10.2%
J02	Acute pharyngitis	118	8.7%	18.9%
J45	Asthma	91	6.7%	25.6%
J46	Asthmatic crisis	83	6.1%	31.7%
J18	Pneumonia	57	4.2%	35.9%
R56	Febrile convulsion	53	3.9%	39.8%
S00	Head injury	42	3.1%	42.8%
J15	Pneumonia	32	2.4%	45.2%
J20	Acute bronchitis	30	2.2%	47.4%
E86	Volume depletion	24	1.8%	49.2%
S42	Fracture, upper limbs	22	1.6%	50.8%
S06	Intracranial injury	21	1.5%	52.3%
J06	Acute pharyngitis	20	1.5%	53.8%
J00	Common cold	17	1.2%	55.0%
K35	Acute appenditis	17	1.2%	56.3%
Total		1361	100.0%	

ICD	Diagnosis	15 to 39 y.o		
		N	%	Cum %
T50	Poisoning	178	8.5%	8.5%
A09	Acute entero-gastritis, diarrhea	79	3.8%	12.2%
S06	Intracranial injury	74	3.5%	15.7%
K35	Acute appenditis	68	3.2%	19.0%
O90	Complications of the puerperium	51	2.4%	21.4%
J93	Pneumothrax	37	1.8%	23.2%
S02	Fracture, head	34	1.6%	24.8%
O80	Encounter for full-term uncomplicated delivery	33	1.6%	26.4%
O20	Hemorrhage in early pregnancy	30	1.4%	27.8%
J18	Pneumonia	27	1.3%	29.1%
S32	Fracture of lumbar spine and pelvis	27	1.3%	30.4%
T42	Poisoning by, adverse effect of and underdosing of antiepileptic, sedative- hypnotic and antiparkinsonism drugs	26	1.2%	31.6%
I46	Cardiac arrest	25	1.2%	32.8%
O47	False labor	25	1.2%	34.0%
J20	Acute bronchitis	24	1.1%	35.1%
Total		2102	100.0%	

they have high-tech equipment and relatively enough human resources for emergency care. They are expected to treat severe cases that are beyond the capacity of secondary facilities.

However, as this study showed, the tertiary centers received many primary and secondary cases. This

is partly because the Japanese system does not have a systematic referral scheme. The free choice of patients is another factor for this low level of functional differentiation. It is clear that the current situation has some problem for cost-efficient use of resources for emergency care. The medical professionals of tertiary

Table 3 (continue)

ICD	Diagnosis	40 to 64 y.o.		
		N	%	Cum %
I61	Cerebral bleeding	223	7.1%	7.1%
I21	AMI	190	6.0%	13.1%
I63	Cerebral infarction	150	4.8%	17.9%
I60	SAH	127	4.0%	21.9%
S06	Intracranial injury	95	3.0%	25.0%
I20	Angina pectoris	84	2.7%	27.6%
I46	Cardiac arrest	81	2.6%	30.2%
I50	Heart failure	74	2.4%	32.6%
K25	Gastric ulcer	67	2.1%	34.7%
K92	Other diseases of digestive system	63	2.0%	36.7%
T50	Poisoning	56	1.8%	38.5%
K56	Ileus	47	1.5%	40.0%
S82	Fracture of lower leg, including ankle	37	1.2%	41.2%
G40	Epilepsy and recurrent seizures	36	1.1%	42.3%
I71	Aortic aneurysm	35	1.1%	43.4%
Total		3144	100.0%	

ICD	Diagnosis	65 y.o. and more		
		N	%	Cum %
I63	Cerebral infarction	527	8.7%	8.7%
I21	AMI	363	6.0%	14.8%
I50	Heart failure	350	5.8%	20.6%
I61	Cerebral bleeding	331	5.5%	26.1%
I46	Cardiac arrest	217	3.6%	29.7%
S06	Intracranial injury	203	3.4%	33.0%
J18	Pneumonia	183	3.0%	36.1%
I20	Angina pectoris	180	3.0%	39.1%
S72	Hip fracture	170	2.8%	41.9%
K56	Ileus	140	2.3%	44.2%
I60	SAH	139	2.3%	46.5%
I71	Aortic aneurysm	128	2.1%	48.6%
K92	Other diseases of digestive system	105	1.7%	50.4%
J69	Pneumonitis due to solids and liquids	91	1.5%	51.9%
K25	Gastric ulcer	90	1.5%	53.4%
Total		6028	100.0%	

facilities treat severe cases under the large vague of slight cases. Their workload should be very high in treating tremendous volume of non-severe cases.

Furthermore, the number of patients who use the emergency division is continuously increasing, while the number of medical staffs of emergency division has been chronically in shortage. This situation causes a burn-out phenomenon among the medical staffs and they have finally quitted the post. In order to cut this

vicious cycle, an appropriate evaluation of this section is indispensable.

In order to realize an appropriate arrangement of emergency services, the French government set the criteria of emergency facilities; such as equipment and human resources that they must have, and at the same time regulate the geographical arrangement by contracting under the Regional Health Care Plan (RHCP). The Japanese RHCP does not have this kind of com-

elling power.

In considering the increasing number of ambulance transfer because of ageing (i.e., increasing pneumonia cases and hip fracture cases) and changing mind of users (more consumerism), the government is required to establish an appropriate program to tackle this problem. It will be crucial how to enforce the compelling power of RHCP. This requires quality information about the actual situation. The DPC data will serve as one of such information resources.

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