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Prevalence of Coding Z515 Diagnosis in Cancer Patients and Relationship between Treatment and Cost in Songklanagarind Hospital, Hat Yai, Songkhla

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Abstract

Introduction: Code Z515, which indicates palliative care, is a part of the International Classification of Diseases and Related Health Problems (ICD). At present, this diagnostic code is still rarely used although the number of patients requiring palliative care is increasing. So many patients forfeit their right to access the best palliative care and all that it entails.

Objectives: To determine the prevalence of the code Z515 diagnostis according to ICD-10 in patients diagnosed with cancer as well as the relationship between treatment and costs in Songklanagarind Hospital.

Methods: A retrospective descriptive study on patients diagnosed with code Z515 in Songklanagarind Hospital between 2012 and 2016 was conducted. We collected data from our hospital information system (HIS) and divided into 2 groups, In and outpatients department. Then we recorded data using extraction forms. We analyzed the data using percentages, 95% CI and odds ratios.

Results: Prevalence of diagnosis with code Z515 in cancer patients was 1.7×10^{-3} for both in- and outpatients. For outpatients, patients who received radiation and combined treatment were 9.4 and 26.5 times, respectively, to incur medical costs in the range of 4,001 to 6,000 THB (118-177 USD) compared with patients who received supportive treatment or had no cost. The results shows no relationship between the number of medications taken and cost among inpatients, there was no observable difference in statistical significance The same was true for the relationship between treatment and costs as well.

Conclusion: Study found a very low prevalence of coding Z515 use. Although we know that all cancer patients should receive the best palliative care, the greater their benefit from this type of treatment, the Z515 diagnosis remains less pervasive than it should be.

Keywords: ICD10; Z515; Palliative; Prevalence; Cost; Treatment

Introduction

At present, the Ministry of Public Health of Thailand employs a diagnosis system called ICD (International Classification of Disease and Related Health Problem). ICD was begun to use in 1893 in order to indicate the death in the international code. In 1948 World Health Organization (WHO) updated ICD to 6th edition and continue to develop ICD-10 until now including add new information to make it up-to-date. The recent edition of ICD, ICD10: 2010, was adjusted in 2010. Two main components of ICD-10 are Classification of diseases and health problems in humans and Codes of diseases and health problems. For classifying diseases, ICD-10 uses Nosology (the branch of medical science dealing with the classification of diseases) to group similar condition in the same category. ICD-10 uses alphabet follow with numbers as coding of diseases and health problems [1]. Such as A00-B99 mean group of Certain infectious and parasitic diseases, Z00-Z99 mean Factors influencing health status and contact with health services. Benefits of ICD -10 are diagnosis cause of death, to evaluate common causes of death, diagnosis in the patient database, to evaluate situation in common diseases, to evaluate outcomes of patients in each diseases, to evaluate continuous care in each diseases, to evaluate

assessment of the patient in each disease, to evaluate the effectiveness of service in each diseases, to evaluate of fairness in providing service in each disease [2]. For all codes, we interested in Z515. Z51 is encounter for other aftercare and medical care and Z515 is palliative care.

In Thailand, when people have the right to health care service. The rights separate to 3 main groups; Universal Coverage Scheme, Civil Servant Medical Benefit Scheme and Social Health Insurance Benefit Scheme. One person can use only on right. After births, every Thai citizen can use Universal Coverage Scheme to access health care treatment. However, some people can change their right to Civil Servant Medical Benefit Scheme and Social Health Insurance depends on their occupation and work place. For example, if you work as civil servant, you can use only Civil Servant Medical Benefit Scheme [3].

Nowadays, patients who diagnosed with code Z515 and used universal coverage scheme will receive extra fund for caring these groups from National Health Security Office (NHSO) [3]. But up to now, there are errors and incomplete in the diagnosis of several diseases due to ICD-10's details are quite complicate. Coding "Z515" that stands for "palliative care" is a part of ICD-10; however, it is still used sparingly even though the number of patients who need palliative care is increasing. The reasons may relate to the fact that many

healthcare providers are unaware of coding Z515 and the need for using it in patient diagnosis. As a result, many patients are deprived of their rightful access to the best palliative care, which provides the patients with the opportunity to face the end of life with dignity, to fulfill one's wishes before they pass away, to receive early and appropriate care planning, relieve suffering or other symptoms of distress, etc. Moreover, it slows down the development of palliative care services [4]. At present, the patients requiring palliative care are many, e.g., cancer patients, end-stage chronic illness patients, and others. However, the main group need it involves cancer patients because the criteria for selecting palliative care in chronic illness is very complicated, and the diagnosis of the severity of the condition depends on the doctors' experience. In this study, we decide to investigate the frequency and prevalence of diagnosing with coding Z515 in cancer patients seen in both inpatient and outpatient departments of Songklanagarind hospital, who constitute the main group of palliative care recipients in our institution. Songklanagrind hospital is a tertiary care and has one palliative unit. Its findings will serve as evidence in the further development of palliative care services at Songklanagarind hospital.

Materials and Methods

This descriptive research utilized retrospective data. The patient data collected from the Hospital Information System (HIS) of Songklanagarind Hospital were reviewed. Then we chose all of the patients who were diagnosed with coding Z515 of ICD-10 and underwent palliative care from 1 January, 2012 to 31 December, 2016. After approval by the Prince of Songkla University (PSU) Ethics Committee, We collected data by searching for the patient's hospital number in the Hospital Information System (HIS). The hospital number was then changed to a sample code in the process of data collection. After that, we reviewed the date and department that diagnosed the Z515 coding and recorded that information in the extraction form. The data reviewed from the HIS were sex, age, the right of access to healthcare services, date of diagnosis, first and last department that diagnosed the Z515 coding, other departments that diagnosed the same coding, other code diagnosis beside Z515, the latest treatment received, number of regularly-used medications, symptoms that persisted in the latest record, ward name, duration of hospitalization (for IPD cases), and the average cost of treatment.

We counted numbers of patients who diagnosed with ICD-10 codes Z515 and cancer diagnoses only one time per year. We input the collected data in Microsoft Excel 2013, and analyzed them in terms of percentage and 95% CI (considered significant when the 95% CI was in the given range).

Costs of treatment, we counted by plus all expenses those patients who diagnosed with codes Z515. We can find from HIS. Then brought them to find mean of costs for one patient per time.

For the nominal data variables, we used Fisher's exact test and the logistic regression model to analyze their relationship and adjust for confounders. The results are shown as odd ratios with a 95% CI in table and graphic form.

Results

Outpatients

We included 443 patients, 226 males (51.0%) and 217 females (49.0%). The most frequent diagnosis with coding Z515 involved 50-59 year-old patients (30.2%), followed by 60-69 year-olds (25.7%). Most of the patients used the Universal Coverage Scheme (65.0%). Regarding the department that used coding Z515 first, the Department of Radiology employed it most frequently (86.7%) (Table 1).

Associated factor	Outpatients (443)	Inpatients (75)	Associated factor	Outpatients (443)	Inpatients (75)
Sex N (%)			**Right N (%)**		
Male	226 (51.0)	30 (40.0)	Universal Coverage Scheme	288 (65.0)	52 (69.3)
Female	217 (49.0)	45 (60.0)	Civil Servant Medical Benefit Scheme	114 (25.7)	12 (16.0)
Age (years) N (%)			Social Health Insurance	25 (5.6)	5 (6.7)
0 – 9	7 (1.6)	8 (10.7)	Cash	16 (3.6)	6 (8.0)
10 – 19	9 (2.0)	8 (10.7)	**First department N (%)**		
20 – 29	5 (1.1)	2 (2.7)	Radiology	384 (86.7)	4 (5.3)
30 – 39	22 (5.0)	4 (5.3)	Internal Medicine	34 (7.8)	13 (17.3)
40 – 49	68 (15.3)	5 (6.7)	Pediatrics	14 (3.2)	14 (18.7)
50 – 59	134 (30.2)	14 (18.7)	Surgery	4 (0.9)	18 (24.0)
60 – 69	114 (25.7)	19 (25.3)	Obstetrics and Gynecology	2 (0.5)	19 (25.3)
70 – 79	53 (12.0)	9 (12.0)	Ophthalmology and ENT	2 (0.5)	0 (0)
80 – 89	27 (6.1)	5 (6.7)	Orthopedics	2 (0.5)	6 (8.0)
90 – 99	4 (0.9)	1 (1.3)	Emergency	1 (0.2)	1 (1.3)

Table 1: Demographics of patients diagnosed with coding Z515 in Songklanagarind Hospital (2012-2016).

The prevalence of Z515 diagnosis in cancer outpatients was 0.0009% (2012), 0.0003% (2013), 0.0015% (2014), 0.0021% (2015), and 0.0036% (2016). The average prevalence of a diagnosis with Z515 coding in cancer patients over these five years was 0.0017% (Table 2).

Year	Frequency		
	Number of Z515 diagnoses	Number of cancer diagnoses	Prevalence
2012	89	99,837	0.9×10^{-3}
2013	34	106,052	0.3×10^{-3}
2014	164	105,891	1.5×10^{-3}
2015	236	110,908	2.1×10^{-3}
2016	426	119,995	3.6×10^{-3}
Total	949	542,683	1.7×10^{-3}

Table 2: The prevalence of Z515 diagnosis in cancer outpatients (2012-2016).

There are 165 ICD codes, which were diagnosed with coding Z515. The top three ICD codes that were diagnosed most frequently were: 1. C795 (secondary malignant neoplasm of the bone and bone marrow): 51.9%, 2. C793 (secondary malignant neoplasm of the brain and meninges): 34.3%, and 3. C780 (secondary malignant neoplasm of the lung): 20.1%.

The patients who used 1-3 drugs were 8 times more likely to incur hospital costs in the 4,001-6,000 THB (118–177 USD) range, those taking 4-6 drugs were 9 times more likely to have costs in the range of 2,001 to 4,000 THB (59–118 USD), and the ones requiring more than 6 drugs were 10 times more likely to spend more than 6,000 THB (177 USD) compared with patients who took no medication or had no cost (Figure 1).
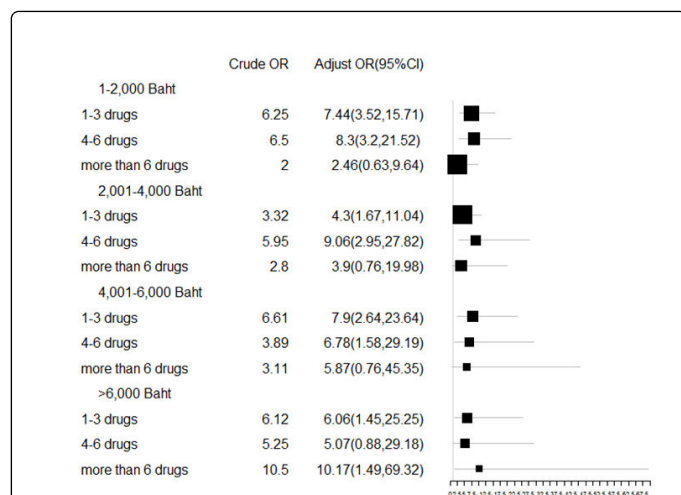

Figure 1: Relationship between number of medications and average cost in each outpatient who was diagnosed with Z515 from 2012 to 2016.

The patients who received radiation and combined treatment were 9.4 and 26.5 times, respectively, to incur medical costs in the range of 4,001 to 6,000 THB (118–177 USD) compared with patients who received supportive treatment or had no cost. Concerning chemotherapy and other patients, no statistically significant difference was detected (Figure 2).
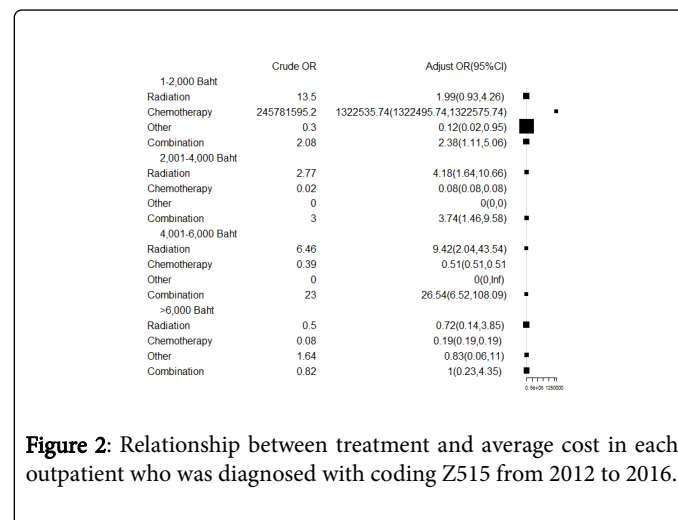

Figure 2: Relationship between treatment and average cost in each outpatient who was diagnosed with coding Z515 from 2012 to 2016.

Inpatients

There were 75 inpatients, of which 30 were males (40.0%) and 45 females (60.0%). The 60-69 year-old patients (25.3%) saw the most frequent use of the Z515 diagnosis. Once more, they used the Universal Coverage Scheme for the most part (69.3%). Coding Z515 was used first for the patient diagnosis by the Department of Obstetrics and Gynecology most frequently (25.3%) (Table 1).

The prevalence of Z515 diagnosis in cancer inpatients was 0.00011% (2012), 0.0013% (2013), 0.0021% (2014), 0.0023% (2015), and 0.0024% (2016). Meanwhile, the prevalence of diagnosis using coding Z515 among these patients during this five-year period was 0.0017% (Table 3).

Year	Frequency		
	Number of Z515 diagnoses	Number of cancer diagnoses	Prevalence
2012	1	8,556	0.11×10^{-3}
2013	13	9,751	1.3×10^{-3}
2014	21	9,945	2.1×10^{-3}
2015	24	10,389	2.3×10^{-3}
2016	25	10,416	2.4×10^{-3}
Total	84	49,057	1.7×10^{-3}

Table 3: Prevalence of Z515 diagnosis in cancer inpatients (2012-2016).

There were 226 ICD codes that received the Z515 diagnosis. The top three were: 1) C795 (secondary malignant neoplasm of bone and bone marrow) 28.0%, 2) C780 (secondary malignant neoplasm of lung) 28.0%, 3) E876 (hypokalemia) 28.0%.

The results shows no relationship between the number of medications taken and cost among inpatients-there was no observable difference in statistical significance The same was true for the relationship between treatment and costs as well (Figure 3).
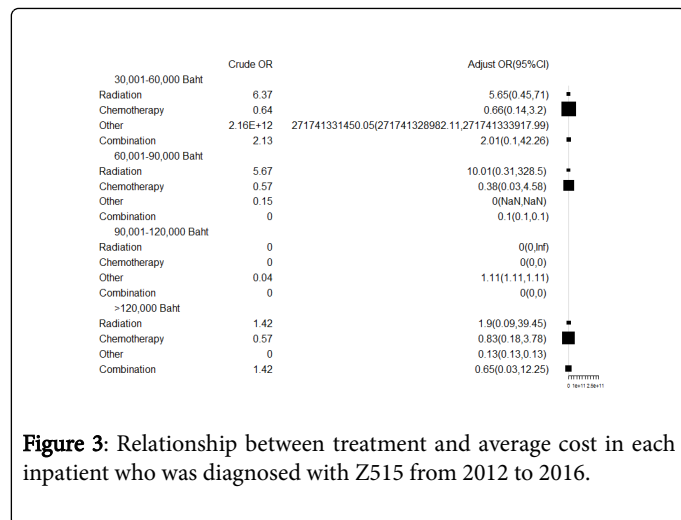

Figure 3: Relationship between treatment and average cost in each inpatient who was diagnosed with Z515 from 2012 to 2016.

Discussion

Outpatients

The proportions of males and females were quite similar. When we classified the patients by age group, we found that the most common age range was middle age to elderly. As people grow older, the rate of cancer also increases, so this age range is proper time for cancer screening in general [5]. That is why most patients in our study were of middle to elderly age. The department with the most Z515 diagnoses was Radiology (87.0%) because one associate professor in this department is an NHSO member, so he has optimal awareness and understanding regarding this diagnosis. Concerning other ICD-10 codes that were co-diagnosed with Z515, we found 165 codes, and all of them involved malignancy. Secondary malignancy or metastasis coding was more prevalent than that for primary cancer because metastatic disease indicates an advanced stage of cancer that corresponds to the criteria for the Z515 diagnosis. The top three codes were C795 (secondary malignant neoplasm of bone and bone marrow), followed by C793 (secondary malignant neoplasm of brain and meninges) and C780 (secondary malignant neoplasm of lung) because many primary cancers involve the same metastatic organ such as the brain, bones, the liver etc. The prevalence of coding Z515 was very low, only 1.7×10^{-3} due to a pronounced lack in awareness among our healthcare providers [6]. Hence, we should thoroughly investigate the reasons why other departments seldom employ the Z515 diagnosis among both cancer and non-cancer patients. We have the responsibility to make the healthcare providers aware of this coding and understand the importance of the Z515 diagnosis for palliative care patients. A Z515 diagnosis would not only enable the patient reap the benefits of the best palliative care, but also enhance the hospital's reimbursement from the government. In regards to the relationship between the number of medications given to the patient and the average cost, receiving more than 6 medications carries a cost more than 6,000 baht (177 USD). This shows that increasing the number of medications makes elevates the average medical cost. Yet, the patients receiving 1-3 medications had higher costs than those who took 4-6 medications. This may be related to the high cost of some medications such as sustained-release morphine, etc.

Inpatients

From 2012 to 2016, 75 patents were diagnosed with Z515 in our hospital. Females (60%) predominated males (40%), and most of the inpatients were 50-59 years old, followed by children (0-9 years old) and adolescents (10-19 years old), which had the same proportion (10.8%). They required hospitalization for chemotherapy as a standard treatment for conditions such as hematologic malignancy [7] and osteosarcoma [8]. Most of the inpatients claimed the Universal Coverage Scheme as their right of access the healthcare services (69.3%). This proportion was similar to that of outpatients.

Concerning other ICD codes co-diagnosed with Z515 coding, 226 codes were identified. Most of them involved codes C795 (secondary malignant neoplasm of bone and bone marrow) and C780 (secondary malignant neoplasm of lung), which shared the same percentage (21%). This finding was quite similar to the one related to outpatients. The third most common code was E876 (hypokalemia), 21 people (9.3%). This incidence was higher among inpatients than outpatients because it is a medical condition that requires hospitalization. The prevalence of coding Z515 (1.7×10^{-3}) was very low and the same was true in the case of outpatients. The cost of treatment for inpatients was higher than that for outpatients because most of them remained hospitalized until they died, and some of them experienced complications from medical procedures [9-13].

Conclusion

This study found a very low frequency and prevalence of the use of coding Z515 in diagnosing palliative care patients at Songklanagarind Hospital. In spite of the pervasive knowledge that all cancer patients should receive the best supportive care that is available and that the earlier we diagnose them as palliative care patients, the greater they benefit from the treatment, coding Z515 remains underused in patient diagnosis.

Therefore, if doctors, who influence the patient treatment the most, have adequate awareness of the possibility to co-diagnose with coding Z515, the patients will receive the best quality of care available during the end stage of their life, which would significantly improve the quality of life of both patients and their relatives. Moreover, our hospital would increase the reimbursement received from the government, which would translate into more resources and more patients helped.

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