

Conflict of Interest

All PMDA members involved in MIHARI project have no dealings or transaction with any vendor, pharmaceutical companies or any other party which could result in benefit to us.

Abstract

Background:

Heparin is an anticoagulant commonly used for treatment and prevention of thromboembolism, or prevention of blood clot occurred by extracorporeal circulation, dialyzed and others, however, this drug can cause Heparin Induced Thrombocytopenia (HIT). Heparin is categorized into two types such as traditional unfractionated (UF) Heparin, and novel low molecular weight (LMW) Heparin, whose risk of HIT is known to be lower than UF Heparin's.

Objective:

To investigate the use of Heparin (UF or LMW) and the risk of HIT among patients hospitalized for lower limb surgery using Japanese claim data.

Methods:

The Japanese claim data of inpatients called Diagnosis Procedure Combination (DPC) data was used. The owner of these data, a DPC system vender, performed all analysis by following the protocol prepared by PMDA. The base population included about 1.5 million of patients hospitalized in 128 hospitals during July 2010 to December 2012. Two targeted populations were defined by prescription of UF or LMW Heparin given within 7 days after lower limb surgery. Distribution of patient demographics, prescribed duration after surgery, and the incidence proportion of HIT were calculated.

Results:

Among 1.5 million of the base population, 6,157 patients were prescribed UF Heparin and 3,596 patients were prescribed LMW Heparin within 7 days after lower limb surgery. Their median ages were 76 years and 77 years in the patients prescribed UF and LMW Heparin, respectively. As to prescribed durations, 4,143 patients (67.3%) were prescribed UF Heparin for only one day. On the other hand, 3,515 patients (97.7%) were prescribed LMW Heparin for 2-14 days. The incidence proportions of HIT were 0.19% for UF Heparin and 0.08% for LMW Heparin, which were lower than those reported in previous studies.

Conclusions:

This study investigated the utilization of UF and LMW Heparin among patients hospitalized for lower limb surgery using claim data. Although their prescribed durations were different, there was not much difference in the incidence proportion of HIT between UF and LMW Heparin.

Background

- Heparin is an anticoagulant commonly used for treatment and prevention of thromboembolism, or prevention of blood clot occurred by extracorporeal circulation, dialyzed and others. However, this drug can cause HIT, and it is also known that a risk of HIT increases after orthopedic surgery such as lower limb surgery.
- Heparin is categorized into two types such as traditional unfractionated (UF) Heparin, and novel low molecular weight (LMW) Heparin, whose risk of HIT is known to be lower than UF Heparin's.
- Prescribed dosage of Heparin (UF or LMW) and incidence proportion of HIT in patients hospitalized for lower limb surgery has not been investigated well in Japan. Thus, Drug Use Study of Heparin was performed using Japanese claim data of inpatients.

Objective

To investigate the use of Heparin (UF or LMW) and the risk of HIT among patients hospitalized for lower limb surgery using Japanese claim data.

Methods

Data source

- DPC is a comprehensive inpatient reimburse system corresponding to DRG system in USA. DPC data is collected for all inpatients discharged from the participating DPC hospitals. In this study, The DPC data was used which is in the possession of a DPC system vender.
- This dataset included 1,526,739 patients who were hospitalized in 128 hospitals from July 2010 to December 2012.
- Because orthopedic surgery such as lower limb surgery is commonly performed over the course of hospitalization, DPC data is suitable for this study.

Study populations

- Two study populations were identified from the source dataset with at least one prescription of 1)UF or 2)LMW Heparin given within 7 days after lower limb surgery.

Definition of HIT

- We defined HIT as follows; any treatment or alternative drug usually given when HIT occurred was prescribed, and Heparin was never given after such prescriptions.

Analysis

- Background characteristics (gender, age) of study populations were summarized.
- The total days of Heparin prescriptions after lower limb surgery were also summarized.
- The numbers and percentages of patients developed HIT after prescribed Heparin were calculated.

Results

Table1. Background characteristics in study populations

		UF Heparin No. of Patients (% of total)	LMW Heparin No. of Patients (% of total)
Gender	Male	1,608 (26.1)	691 (19.2)
	Female	4,549 (73.9)	2,905 (80.8)
Age	0-9	10 (0.2)	0 (0)
	10-19	63 (1.0)	10 (0.3)
	20-29	76 (1.2)	6 (0.2)
	30-39	90 (1.5)	14 (0.4)
	40-49	195 (3.2)	56 (1.6)
	50-59	476 (7.7)	211 (5.9)
	60-69	1,015 (16.5)	594 (16.5)
	70-79	1,871 (30.4)	1,290 (35.9)
	80-89	1,815 (29.5)	1,122 (31.2)
	90-	546 (8.9)	293 (8.1)
Total		6,157 (100)	3,596 (100)
Mean±SD (years)		73.2±15.2	75.6±11.4
Quartile	25%	66	70
	50%	76	77
	75%	83	83

Table2. The total days of Heparin prescriptions

The total days of prescriptions	UF Heparin No. of Patients (% of total)	LMW Heparin No. of Patients (% of total)
1	4,143 (67.3)	42 (1.2)
2-7	1,367 (22.2)	2,176 (60.5)
8-14	506 (8.2)	1,339 (37.2)
15-	141 (2.3)	39 (1.1)
Total	6,157 (100)	3,596 (100)

Table3. The numbers and percentages of patients developed HIT

	UF Heparin No. of Patients (% of total)	LMW Heparin No. of Patients (% of total)
HIT(+)	12 (0.19)	3 (0.08)
HIT(-)	6,145 (99.81)	3,593 (99.92)
Total	6,157 (100)	3,596 (100)

Limitations of the study

- The case definition of HIT is not validated.
- The procedure data might not be fully collected in DPC data because the DPC data is comprehensively collected.

Conclusions

Although LMW Heparin was known to have lower risk of HIT than UF Heparin, there was not much difference in the incidence proportions of HIT between these two types of Heparin users in this study. There might be the misclassification of case or the lack of the procedure data.

Study population (Table1)

- Baseline characteristics of UF Heparin users and LMW Heparin users are shown in Table1. There were no difference in two groups, and both study populations have high proportions of female and the elderly.

The days of prescriptions for Heparin (Table2)

- 70% of UF Heparin users were prescribed for one day, on the other hand 60% of LMW Heparin users were prescribed for 2-7 days.

Incidence proportions of HIT (Table3)

- The incidence proportions of patients who developed HIT were not much different between UF and LMW Heparin users.