

ABSTRACT

Introduction: Venous thromboembolism (VTE) is one of the leading causes of maternal mortality in the Western world. Sequential compression devices (SCD) are recommended for all obstetric hospitalizations from admission until time of discharge. Despite the significant benefits of SCD during pregnancy and postpartum, past studies have shown that SCD compliance is low, with noncompliance rates ranging from 21-42%. Recently, the department of obstetrics and gynecology at the Medical College of Wisconsin implemented a quality improvement protocol where each antepartum admission order set included pre-checked order for SCDs. The purpose of this study was to evaluate whether this change has led to increased utilization of SCD among pregnant women.

Methods: This was a prospective observational trial and included all pregnant women with a viable pregnancy admitted to Froedtert Hospital for inpatient management of their obstetric or medical complications between May 2017 and August 2017. Women with VTE in current pregnancy or women receiving therapeutic anti-coagulation were excluded. Demographics (age, race) and clinical maternal characteristics including body mass index, parity, gestational age on admission, presence of hypertension, diabetes and other medical co-morbidities were collected through chart abstraction. Indication for admission, presence of SCD order set and length of stay were abstracted as well. During daily morning rounds the study investigators assessed whether the SCD was in the room and whether the SCD was in use. Summary statistics, such as mean, median, standard deviation, range and correlation were used as a first step to examine data.

Results: During the study period a total of 143 rounding encounters were documented on 54 eligible admissions. Mean maternal age was 28.2 ± 5.42 and racial distribution demonstrated 44.4% Non-Hispanic White, 44.4% Non-Hispanic black, 7.41% Hispanic, and 3.70% of other racial/ethnic background. Mean maternal BMI was 32.5 ± 8.58. The most common indication for hospitalization was preterm labor and preeclampsia (both 16.7%), followed by cervical insufficiency/dilation (14.8%). Mean length of stay was 6.39 days ± 7.84.

Seventy percent of admissions had a documented order set placed for SCD with 76.3% of these orders being placed on hospital day 1 and additional 15.8% orders placed on hospital day 2. Among women who had documented order set for SCD only 73.7% (28/38) had the device in the room and SCDs were observed being used in only 28.9% (11/38) of admissions. During repeat encounters, only 13.3% were using the SCD machine during inpatient rounds.

Conclusion: Although pre-checked order set for SCDs among antepartum patients increased the number of SCD orders it did not result in an increased utilization of SCDs among hospitalized pregnant women

BACKGROUND

- Venous thromboembolism (VTE) is the 6th leading cause of maternal mortality in the Western world.
- Sequential compression devices (SCD) are recommended for all obstetric hospitalizations from admission until time of discharge.
- Past studies in non-obstetric population have shown that SCD compliance is low, with noncompliance rates ranging from 21-42%, despite significant benefits of SCD during pregnancy and postpartum.
- Recently, the department of obstetrics and gynecology at the Medical College of Wisconsin implemented a quality improvement protocol where each antepartum admission order set included pre-checked order for SCDs.

OBJECTIVE

The objective of this study is to assess whether antepartum admission order sets including pre-checked order for SCDs lead to an increase in SCD utilization among pregnant women.

METHODS

- Prospective observational study
- Inclusion criteria:
 - Pregnant women over 18 years of age
 - Inpatient hospitalization longer than 1 day
- Exclusion criteria:
 - Women with a history of VTE or active VTE
 - Women receiving medical anticoagulation with low-molecular weight heparin or unfractionated heparin
- During daily morning rounds (week days, between 7am-10am) the study investigators assessed the following:
 - Was the SCD order was placed?
 - Was the SCD machine in the room?
 - Was the patient wearing the device?.
- Summary statistics, such as mean, median, standard deviation, range and correlation were used

RESULTS

- 56 admissions were included and 143 encounters were observed

Table 1. Maternal Characteristics

Maternal Characteristics	Value	Primary Reasons for admission	Value
Age	28.2 ± 5.42	Preeclampsia	13 (24.1)
Race		Preterm Labor	9 (16.7)
Non-Hispanic White	24 (44.4)	Cervical Insufficiency/Dilation	8 (14.8)
Non-Hispanic Black	24 (44.4)	Fetal growth restriction	3 (5.56)
Hispanic	4 (7.41)	Fetal growth restriction	3 (5.56)
Other	2 (3.70)	Preterm premature rupture of membranes	3 (5.56)
Length of Hospital Stay	6.39 ± 7.84	Placenta previa	2 (3.70)
Body Mass Index	32.5 ± 8.58	Placenta accreta	2 (3.70)
Gestational Age at time of admission	30.5 ± 4.82	Nonreactive No Stress Test	2 (3.70)
Gestational age during encounter	30.6 ± 3.55	Gestational diabetes	1 (1.85)
Nulliparity	18 (33.3)	Kidney Stone	1 (1.85)
Other major medical conditions	37 (68.5)	Oligohydramnios Monitoring	1 (1.85)
Multifetal Gestation	12 (22.2)	Opioid withdrawal	1 (1.85)
Chronic Hypertension	7 (13.0)	Pneumonia	1 (1.85)
Preeclampsia	14 (25.9)	Radio-frequency ablation (RFA)	1 (1.85)
Diabetes	7 (13.0)	Chronic abruption	1 (1.85)
Preterm premature rupture of membranes	4 (7.41)	Sickle Cell Crisis	1 (1.85)
Preterm Labor	14 (25.9)	Vaginal Bleeding	1 (1.85)
Placenta previa or accreta	2 (3.70)	Radio-frequency ablation (RFA)	1 (1.85)
Vaginal Bleeding	10 (18.5)	Sickle Cell Crisis	1 (1.85)

RESULTS

Figure 1. Percent of admissions with SCD ordered (n=56); Percent of admissions with SCD orders ordered on day 1 and day 2, with SCD in room, and with SCD on patient (n=38)

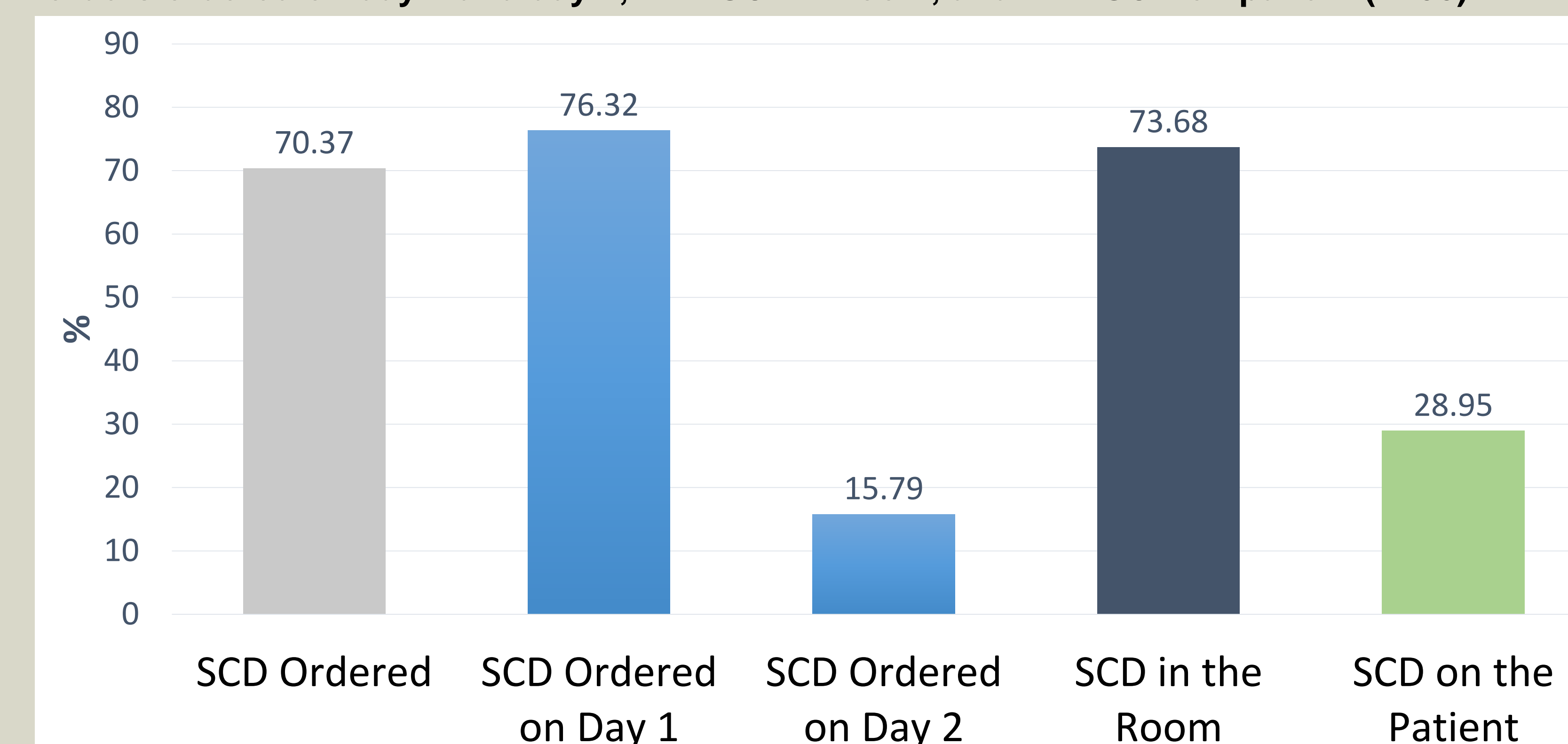


Figure 2. Percent of all encounters with SCD ordered, SCD in the room, SCD on patient, and patient not in bed (n=143)

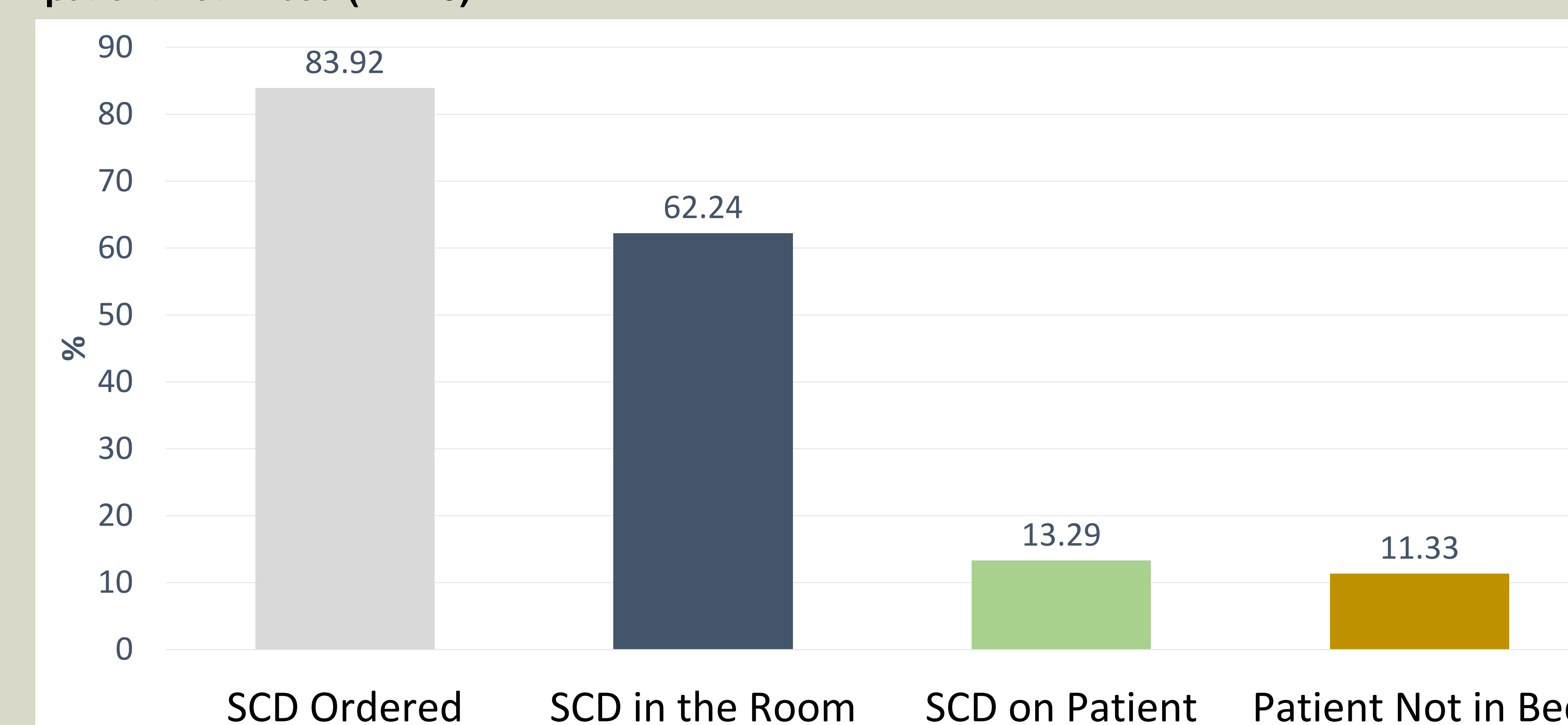


Table 2. Number of encounters, percent of encounters with SCD ordered, SCD in the room, and SCD on patient per hospital day

Day	N=	% SCD Orders	%SCD in the Room	% SCD on Patient	Day	N=	% SCD Orders	%SCD in the Room	% SCD on Patient
2	33	54.5	27.3	12.1	15	3	100.0	100.0	0.0
3	19	68.4	26.3	0.0	18	1	100.0	100.0	0.0
4	13	84.6	53.8	15.4	19	1	100.0	100.0	0.0
5	12	100.0	66.7	0.0	20	1	100.0	100.0	0.0
6	11	100.0	81.2	18.2	21	1	100.0	100.0	0.0
7	8	100.0	87.5	25.0	22	1	100.0	100.0	0.0
8	7	100.0	85.7	14.3	25	1	100.0	100.0	0.0
9	3	100.0	100.0	33.3	26	2	100.0	100.0	0.0
10	1	100.0	100.0	100.0	27	2	100.0	100.0	50.0
11	3	100.0	66.7	0.0	28	1	100.0	100.0	0.0
12	5	100.0	80.0	20.0	29	1	100.0	100.0	0.0
13	5	100.0	100.0	40.0	34	1	100.0	100.0	0.0
14	6	100.0	100.0	33.3	36	1	100.0	100.0	0.0

Conclusion

Although pre-checked order set for SCDs among antepartum patients increased the number of SCD orders it did not result in an increased utilization of SCDs among hospitalized pregnant women.