Advanced Age, Sex, Obesity, Depression, and History of Back Surgeries May Contribute to the Development of Failed Back Surgery Syndrome

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BACKGROUND

- Failed back surgery syndrome (FBSS) is defined as persistent back pain following spine surgery, particularly when the procedure fails to relieve pre-operative symptoms,[1,2] and affects 15 to 40% of patients who undergo spine surgery[3]

OBJECTIVES

The objective of this study was to identify patient characteristics that may contribute to the development of FBSS

METHODS

- De-identified patient records were extracted from Cerner Real World Data (CRWD), a US electronic health record database comprising data from 113 hospital systems, >96 million unique patients, and >1.5 billion encounters
- ICD-10 codes were used to identify patients who underwent spine surgery between 2018 and 2019 and then developed FBSS (M96.1); the first procedure was used as the index
- Diagnoses of depression or anxiety were assessed up to six months pre-index using ICD-10-CM codes (F32.0, F33.0, F34.1, F32.1, F33.1, F32.2, F32.3, F33.2, F33.3)
- Age, body mass index (BMI), and sex were evaluated at index. The number of lifetime back surgeries prior to index was also evaluated
- Univariate and bivariate analyses were conducted using logistic regression to report prevalence ratios of FBSS for patient characteristics including age, history of depression, prior back surgeries, and BMI

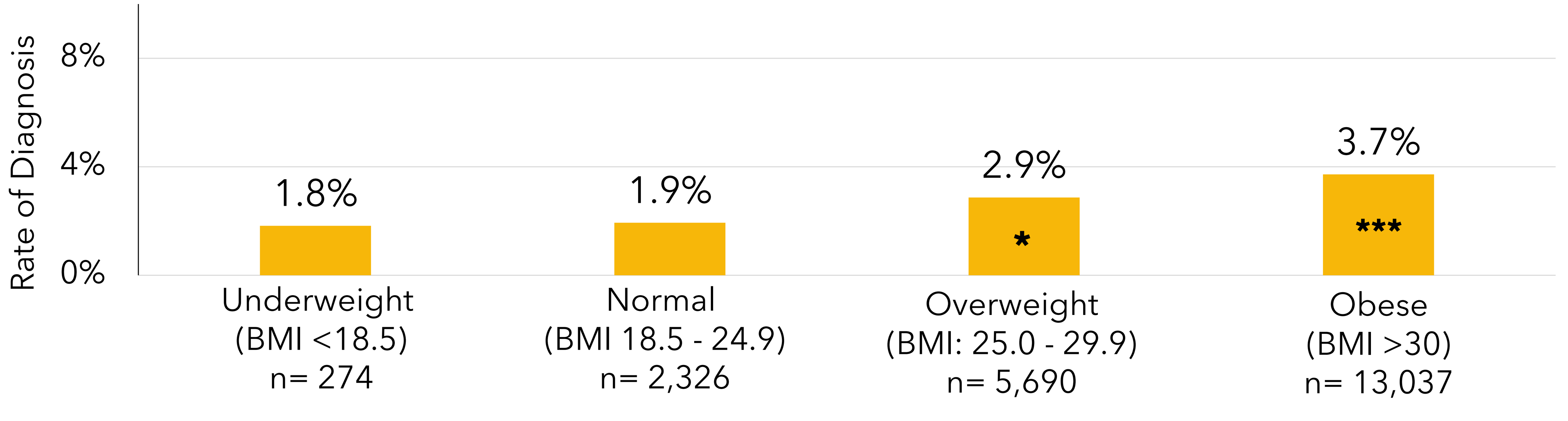
RESULTS

- A total of 22,020 patients underwent spine surgery between 2018-2019, of whom 728 developed FBSS (median age 61 years; 55% female)
- Compared to patients aged 18-44, FBSS was more prevalent in age groups 45-54 and 55-64 by factors of 1.38 (p= 0.0232) and 1.33 (p= 0.03), respectively **(Table 1)**
- Patients who were overweight and obese were 1.48x and 1.92x more likely to have FBSS compared to patients with normal BMI, respectively **(Figure 1)**
- Female patients who were overweight and obese were more likely to have FBSS, by factors of 1.66 (p= 0.0271) and 2.25 (p= 0.00006), respectively

TABLE 1. FBSS Diagnosis by Age Group

Age Group	Patients with FBSS (%)	Prevalence Ratio (95% CI)	P-value
18 to 44 (n= 2,674)	74 (2.8%)	Referent	Referent
45 to 54 (n=3,591)	137 (3.8%)	1.38 (1.31-1.49)	0.0232
55 to 64 (n= 5,746)	212 (3.7%)	1.33 (1.23-1.49)	0.03
65 to 79 (n=8,240)	262 (3.2%)	1.15 (1.05-1.31)	0.285
80+ (n=1,769)	43 (2.4%)	0.88 (0.80-0.93)	0.4902

FIGURE 1. FBSS Diagnosis by BMI Category



*p<0.05 and ***p<0.0001 using normal BMI as reference

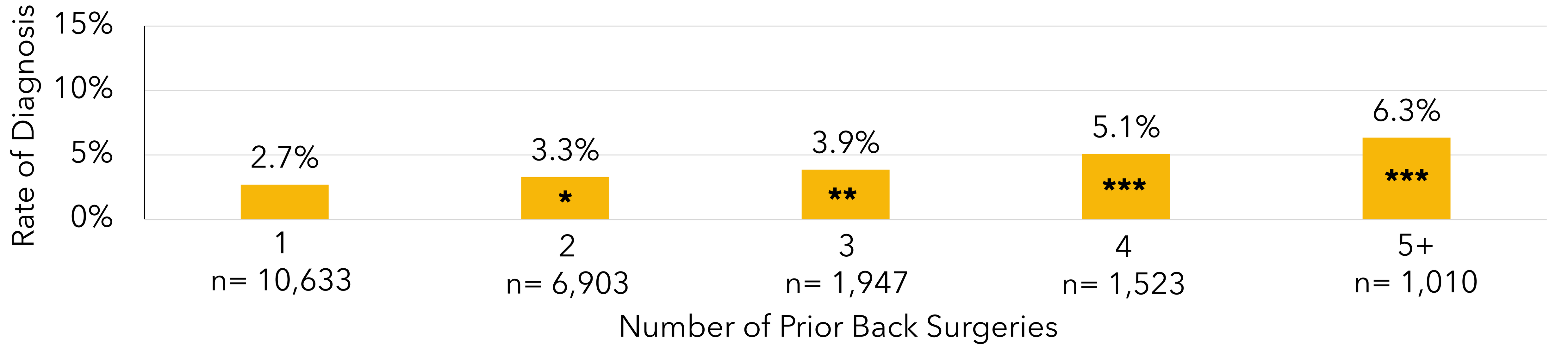
- As depicted in **Table 2**, patients with a history of moderate depression were 1.50x more likely to develop FBSS compared to those with no depression history (p=0.04)
- The prevalence of FBSS was 1.8x higher among females with a history of moderate depression compared to all patients with no history of depression (p=0.011)

TABLE 2. FBSS Diagnosis by Severity of Depression

Severity of Depression	Patients with FBSS (%)	Prevalence Ratio (95% CI)	P-value
None (n= 20,935)	683 (3.3%)	Referent	Referent
Mild (n= 341)	10 (2.9%)	0.899 (0.895 - 0.902)	0.72786
Moderate (n= 489)	24 (4.9%)	1.50 (0.87 - 2.06)	0.04444
Severe (n= 255)	11 (4.3%)	1.32 (0.83 - 1.75)	0.34722

- Compared to patients with 1 prior back surgery, FBSS was 1.22x and 1.43x more prevalent in those who had 2 or 3 prior back surgeries, respectively **(Figure 2)**
- Patients with 4 or 5+ surgeries were 1.88x and 2.36x more likely to have FBSS, respectively **(Figure 2)**

FIGURE 2. FBSS Diagnosis by Number of Prior Back Surgeries



*p<0.05, **p<0.001, and ***p<0.0001 using one prior back surgery as reference

CONCLUSIONS

- Advanced age was associated with increased FBSS, indicating that providers should consider exhausting non-surgical options first in this population
- Women with a BMI ≥25.0 were more vulnerable to FBSS, emphasizing the need to consider benefits vs risks when selecting surgical intervention for back pain in patients with a higher-than-normal BMI
- Candidates for back surgery should be screened for depressive symptoms
- History of back surgeries was a strong contributor to the development of FBSS

REFERENCES

1.Chan CW et al. Pain Med. 2011;12:577-606.
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EPH155