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Original Article

Impact of the Covid-19 Pandemic on The Prevalence of Thoracolumbar Vertebral Compression Fractures in Elderly People

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ABSTRACT

Covid-19 had a profound effect on many parts of life during 2020. Our country, much like the majority of other nations across the globe, saw a Covid-19 epidemic, a wave reaching its height from the middle of March through April of 2020. This brought about significant difficulties for our civilization in a variety of spheres, including the medical, social, and economic spheres. On February 27th, the first patient in our country to be diagnosed with Covid-19 was identified. **Objective:** To evaluate the Covid-19 effect on the prevalence of thoracolumbar vertebral compression fractures in elderly people. **Methods**: A total of 172 individuals with vertebral compression fractures (VCF) were above the age of 65 years. The age and gender of the patients were comparable across the two research groups. Only those people who exhibited symptoms for less than four weeks were taken into account. We analyzed every patient's medical records and obtained all essential data, including demographics (gender, age, and compression fracture risk factors), fracture mechanism, and location of the fracture. **Results:** In 2020, we observed a greater percentage of high-energy VCF (10.5% versus 6.7%). In 2020, there were 7.5 times more recurrent fractures and the proportion of Ankylosing Spondylitis was much higher. Similar admission rates to VCF ED were observed, with 60% receiving conservative care. The number of procedures performed on admitted patients increased in 2020 (66.7% vs. 60%, P =.71), and PBK plus fixation tended to be more common in 2020 compared to 2018-19 (15.8% versus 7.5%, P =.29). In the Covid-19 epidemic, the RR for BKP Plus fixation vs. BKP alone was 1.95, indicating increased risks for difficult operation. In 2020, there were significantly more complications (18.4% vs 3.7%, P.001). Time to surgery also increased somewhat in 2020, from 6.25 days to 5.3 days (P =.55), and admission duration increased marginally (12.2 days vs. 9.9 days, P =.27). Most of the patients choose home treatment over inpatient care during the Covid-19 pandemic (72.2% vs. 58.8%). **Conclusions:** The frequency of VCF did not vary as a result of the Covid-19 pandemic; nevertheless, the features of patients did change, which had an effect on hospitalizations, institutional rehabilitative services, and a predilection for extensive surgery as opposed to BKP alone. Although it is not yet known whether or not COVID-19 will continue to be a problem in the years to come, the effects and lessons it has provided are still valuable.

INTRODUCTION

"Covid-19 had a profound effect on many parts of life during 2020. Our country, much like the majority of other nations across the globe, saw a Covid-19 epidemic, a wave reaching its height from the middle of March through April of 2020. This brought about significant difficulties for our civilization in a variety of spheres, including the medical, social, and economic spheres. On February 27th, the first patient in our country to be diagnosed with Covid-19 was identified [1]. Since the 11th of March, social distance and mobility restrictions have progressively increased, and there have been sporadic complete lockdowns. It was suggested that older folks adhere to even more stringent

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isolation protocols, and many facilities for senior citizens did not let residents leave the facility or receive visitors. By April's end, our nation's largest medical institution had accepted 162 Covid-19 patients, and 65 patients were being treated in two departments intended for Covid-19 patients. Even though the Covid-19 epidemic has just recently emerged, research on its orthopedic implications is increasing quickly. According to several reports, Covid-19 has an impact on orthopedic trauma, notably the load related to hip fractures in the elderly [2-5]. A few studies from various nations showed reduced waiting times for surgery and a reduction in hip fracture incidence of between 10 and 33% [6-10]. VCF affects more women than men, with more than a million cases annually. It is a prevalent pathology in orthopedics and emergency rooms. Spine unit The National Osteoporosis Foundation estimates that there are around 9 million individuals in the United States who have osteoporosis and many others, who have poor bone density, putting everyone at an elevated risk for VCF [11]. VCF may result in significant morbidity, including acute and chronic respiratory problems, functional restrictions, ongoing discomfort, and loss of autonomy [12-13]. VCF significantly lowers the quality of life and causes persistent pain that contributes to kyphosis. This downward spiral starts with a VCF kyphosis and progresses to chronic backache brought on by a shift in the biomechanical load. Increased kyphosis increases the risk of nearby fractures, which worsens the kyphotic deformity and causes pain, disability, and vice versa [14]. Most often, physical therapy is combined with pain management and rapid activity resumption as the first treatment for VCF [15]. The primary therapeutic interventions prior to doing percutaneous minimally invasive surgery are bed rest and conventional analgesics. Even while the majority of VCF patients progressively get better with conservative care, persistent pain, low self-confidence, kyphosis in the elderly, psychological problems, and increased mortality have all been observed regularly [16-18]. Pain treatment and mechanical issues are the two main justifications for surgery. Candidates for surgery include individuals who do not have prompt, meaningful pain relief from conservative therapy, who were not able to take oral painkillers, or who have severe limits to basic daily activities. Another surgical reason that may sometimes need stability beyond cementation is local or gradual kyphosis. Regarding the appropriate time and indications for various operations for VCF, there is still significant debate [19]. VCF is a prevalent condition among the elderly, with a prevalence incidence of 5.4% in people aged 40 and older and 18% in those aged 80 and older. At that age, VCF has the potential to bring on a chain reaction of symptoms and morbidity, which may range from discomfort and impairment to a deterioration of pulmonary and respiratory function. Previously, there were reports published that indicated very high death rates after VCF, reaching up to 72% at five years & 90% after seven years [20-22]. Conservative therapy, which includes narcotics, analgesics, braces, and immobilization, is still regarded as the first line of treatment. There have been reports of constipation, an increased risk of falling opioid dependence, and other adverse effects that are not always well tolerated by older individuals undergoing this therapy [23-24]. In comparison to conservative therapy, minimally invasive surgical procedures like VP and BKP may enhance pain, function, and quality of life, and reduce death rates [25-27]. The goal of this study was to find out how the lockdown and isolation measures taken during the Covid-19 wave, affected the number of elderly people with VCF who went to the emergency department, the types of treatment available to them, and the death rate.

METHODS

Between 2018 and 2020, every patient over 65 who was diagnosed with a VCF in the medical center's emergency department was included in the retrospective cohort study. Only those people who exhibited symptoms for less than four weeks were taken into account. Permission was taken from the ethical review committee of the institute. We analyzed every patient's medical records and obtained all essential data, including demographics (gender, age, and compression fracture risk factors), fracture mechanism, and fracture location. Additionally, we examined hospital records to find out how long the patient was admitted, the reason for the surgery, and the kind of surgery he or she underwent. As a result, we summed all recorded complications, including infectious, surgical, and medical complications, along with mortality at 40 days. Statistical analysis performed in R 3.5.2. The t-test also implemented to compare the ages of patients who visited the emergency room in 2018–2019 and 2020. The Chi-square test and the Fisher exact test utilized in order to make comparisons regarding the patients' gender, previous diagnoses(for example, Osteoporosis, Ankylosing spondylitis). Moreover, to evaluate differences in hospital stays and surgical duration, the Mann-Whitney test executed. Negative binomial regressions are used to assess the complications based on the patient's age and the type of surgery. Multivariate risk analysis also took patient age and a patient's history of compression fracture into account. Using linear regression and adjusting for the patient's age and kind of operation, we also studied the year of arrival & duration of stay.

RESULTS

A total of 172 VCF patients in total were included in our

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sample and received diagnoses in our medical facility ED. This included 38 cases in 2020 and 134 cases in 2019 before the Covid-19 pandemic. A comparison of the number of patients diagnosed with is shown in Table 1

Parameter	2018-2019 N= 134	2020 N= 38	P-value
Age	80.7	80.1	0.64
Female	96	25	0.46
Male	38	13	
AS	2	3	0.04
SURGERY	52	16	0.71
Surgery type BKP	42	10	0.29
Surgery type BKP plus fixation	10	6	0.55
Time to surgery	5.3	6.25	0.91
Admissions	86	24	0.27
Admissions length	9.9	12.2	0.06
Recurrent fracture	1	2	0.37
Low energy fracture	120	33	0.32
High energy fractures	9	4	0.74
Fractures t/d malignancy	5	1	0.35
Lumber fractures	96	21	0.24
Thoracic fractures	38	13	0.0
Total complications	5	7	01

Table 1: Comparison of the number of patients diagnosed with VCF

Demonstration of v arious fractures	2018-2019	2020
Conservative management	8	2
BKP	0	1
Fixation + BKP	1	1
Total	9	4

Table 2: Demonstration of various fractures

In 2020, 89% of high-energy fractures would be treated conservatively, up from 50% in 2018–19, the report claims. During the Covid era, it was shown that repeated fractures occurred 7.5 times more often. (5.3% in 2020 vs.7% in 2018-19, P =0.06). Additionally, there were noticeably higher incidences of AS or DISH among compression fracture patients in 2020 (7.9% vs 1.5% during 2018-19, P =0.04). The rates of diagnosed VCF admissions to the ED in 2018–2019 and 2020 (64% vs. 63%, respectively) were comparable. The majority of VCF patients—about 60%—received conservative treatment. We found that the 2020 group underwent more operations (16/24 (66.7%) compared to 52/86 (60%), P =0.71), among the hospitalized patients. The rate of BKP + fixation in 2020 was higher (15.8% vs 7.5% in 2018-19, P =0 .29) than BKP alone (15.8% in 2020 vs 7.5% in 2018-19). An analysis of multivariate data indicates that during the 2020 Covid-19 pandemic, more challenging operations may be chosen or advised than BKP alone. There was a significant increase in post-surgical complications in 2020 (18.4% vs. 3.7%, P 0.001; as shown in Table 3). The surgical procedure may only cause an infection at the surgical site. In 2018-19 and 2020, conservative treatment was associated with 40% of both groups' difficulties. In 2020 medical consequences include severe renal failure, AF, hypokalemia, pulmonary embolism, edema, and sudden cardiac death. In 2018-2019, there was just one sudden cardiac death (14.3% vs. 20%, P0.001). Overall RR was 1.18 (95% CI 1.01-1.38). Hospital stays in 2020 were significantly longer than in 2018–19 and surgery times were marginally longer (5.3 vs. 6.25, P =0.55). Most of the patients choose home rehabilitation over hospital treatment during the Covid-19 pandemic (P =0.13). We found that 41.2% of patients underwent institutional care in 2018–19 compared to just 28.8% in 2020. A total of 06 patients passed away overall throughout the follow-up period of 40 days, with three passing away among 194 patients in 2018–19 and three passing away among 59 patients in 2020. When comparing the two time periods, we observed no significant variation in the fractures' distribution throughout the spine (P =0.24).

Complication	2018-2019	2020	p-value
Total complication	5	7	0.001
Conservative management	Sepsis with Urinary tract infection Pneumonia	AF MI Urinary tract infection	0.08
BKP	Pneumonia +Urinary tract infection	ARF X2 MI leading to sudden death	0.06
fixation +BKP	Intraoperative Resuscitation Post-operative infection	Atrial fibrillation with hypokalemia	0.02

Table 3: Complications in study participants

DISCUSSION

We are under pressure to provide excellent service despite the difficulties that may arise due to the COVID-19 pandemic predicted to peak in 2020 [28-29]. One of the main objectives of this study was to evaluate the Covid-19 effect, and the lockdowns and isolations that were implemented on the incidence of VCF, trends in rehabilitation and treatment, and mortality patterns in patients who were diagnosed with VCF and assessed in the causality department. We decided to concentrate on this population initially in order to learn more about how to best distribute our resources and since VCF is so prevalent among the elderly, who also constitute a considerable portion of clientele. During the time of our research, the vaccine for Covid-19 was not yet available; Therefore, patients' behavior was heavily influenced by their fear of being exposed to the virus. Comparing the present to the period before to the Covid-19 epidemic, we saw notable changes in our VCF patients. We observed that fewer patients with VCF visited the ED at the duration of the Covid-19 epidemic (38 in 2020 versus 134 in 2018-19), a 44% drop. This decline might be attributed to patients with VCF

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being hesitant to visit the ED for diagnosis and treatment due to concerns about Covid-19 exposure there. VCF patients in 2020 had higher rates of AS or DISH and recurrent fractures, despite equal age and gender distribution. In 2020, the damage mechanism somewhat altered to higher energy etiologies [30]. Additionally, we observed a greater frequency of DISH and Ankylosing Spondylitis in our ED referrals during the Covid-19 epidemic. This is likely because these diagnoses are more severe even in the context of mild injuries, necessitating ED over a community-based examination. In addition, there were more recurring VCF cases recorded during the 2020 Covid-19 pandemic. This result can be explained by patients knowing more about VCF and having a higher suspicion index when they've previously suffered a similar injury. In comparison to the 2018–2019 era, we observed a comparable surgery rate in 2020 with somewhat more complicated procedures. According to our data, modest falls that resulted in lower energy fractures were attended to locally. At the same time, that tendency led to a modest rise in the proportion of patients that needed surgery, including more complicated operations. Although there was a little rise in the number of patients who were given surgery in 2020, we observed comparable admission rates between 2020 and 2018–2019. According to our research, when conservative therapy is clearly needed, more patients declined hospitalization or even a referral to the ED because they were worried about their Covid-19 exposure. Between 2018–19 and 2020, discharge and continuing care changed. There may be a longer hospital stay before patients have the necessary self-care skills to be discharged home due to worries about leaving the hospital for an institutional rehabilitation centre and reports of Covid-19 flare-ups at the time. In 2020, 28.8% of patients selected institutional rehab vs. 41.2% in 2018–19. Given the frequency of Covid-19 in rehab centre& patients' fear of exposure, the trend may be due to their anxieties [31]. There was a 6.25-day delay between admission and surgery as a result of performing conservative treatment first. Despite the workload at our hospital, we consistently kept normal operating rooms open, enabling us to provide patients the treatments they needed [32]. While still within the published rates in the literature, complications for VCF patients were recorded in 2020 at a greater rate than in 2018-2019 [33]. In 2020, we saw an increase in the incidence of pneumonia, UTIs, and other medical problems. The incidence of surgical complications was not different, nevertheless, as we had expected. Those results may be explained by a shift in population characteristics; in 2020, more patients with complicated medical histories were admitted than in 2018–2019 among healthier people.

CONCLUSIONS

The Covid-19 epidemic had a substantial impact on our job; patients and medical professionals had to adapt to its risks and get a better grasp of the new scenario. Despite the health system's focus on the Covid-19 epidemic and the prevalence of VCF, these individuals still need to get the necessary treatment. We observed that while this condition was still prevalent, patient behaviour and expectations had altered in some way. Patients with straightforward VCF who could endure the discomfort probably favored community care. More patients who were hospitalized needed surgery, and they tended to choose BKP over procedures that are more complicated.

Conflicts of Interest

The authors declare no conflict of interest.

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