

Trauma In Children During Lockdown For SARS-CoV-2 Pandemic

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Research

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Abstract

Purpose The purpose of the work is to evaluate the differences between the routine accesses to Pediatric Emergency Room in a second level Children's Hospital and the ones during an extraordinary event as the first month of the lockdown due to the Sars CoV 2 Pandemic in relation to types, sites and severity of Orthopaedic trauma, age, sex, and place in which the trauma occurred.

Methods Authors compared retrospectively all children who had an access to the Emergency Room of Children Hospital Giovanni XXIII of Bari and then to Pediatric Orthopedic Unit during the first month of lockdown due to the Sars CoV 2, from March 10th 2020 to April 10th 2020, with the children that had an access to the same hospital from March 10th 2019 to April 10th 2019 for the sites, the types and the severity of the Orthopedic injuries.

Results In 2019 there were 261 accesses to Emergency Room, in 2020 69: during lockdown the reduction was of 75%.

The data were statistically significant about: the age, lower in 2020 during lockdown, ($p < 0.0001$) and the worst prognosis of the lesions in the same period, 42.65% of fractures versus 28.05% ($p < 0.0003$). No statistical evidence about sex, anatomical site of trauma and kind of lesion.

Conclusions The volume of the accesses for trauma during lockdown decreased by 75%; this means that to avoid the potential risk of Covid's infection in Hospital, only children with major trauma were brought there by parents, while the ones with contusions and sprains remained at home.

Introduction

Coronavirus 2019 (COVID 19) caused by SARS-CoV-2 rapidly spread worldwide: on March 11th, World Health Organization (WHO) officially declared COVID-19 as a pandemic. (World Health Organization) In the same days, the government of Italy imposed a national quarantine (Prime Minister's Decree) that, with exception for essentials, locked down all commercial and industrial activities, schools and universities, sports, cultural and leisure activities, impacting the whole Italian population. [1, 2]

Fractures during childhood are common [3, 4] and have a great effect on the child's and family's daily life. They carry potentially significant social and economic consequences both in the short and long term. [3]. Sports and play are the leading causes for pediatric fractures [4] and the vast majority of major pediatric injuries in emergency rooms are fractures.

Authors want to study the differences between the routine accesses to Pediatric Emergency Room in a second level Children's Hospital and the ones in an extraordinary event as the first month of the lockdown for the Sars CoV 2 Pandemic in relation to types, sites and severity of Orthopaedic trauma, age, sex, and place in which the trauma occurred.

Methods

After the approval by the Institutional Research Committee, all children who had an access to the Emergency Room of Children Hospital Giovanni XXIII of Bari and then to Pediatric Orthopedic Unit during the first month of lockdown due to the Sars CoV 2, from March 10th 2020 to April 10th 2020, were studied for the sites, the types and the severity of the Orthopedic injuries, and compared retrospectively with the children that had an access to the Emergency Room of the same hospital from March 10th 2019 to April 10th 2019.

We decided to compare the children that had a trauma in the first month of lockdown with the children that came to our Hospital for a trauma in the same month the year before, and not with that ones who came the month before lockdown, because there is a different incidence of children traumas related to stagionality. [4]

The inclusion criteria were:

- a trauma or a musculoskeletal lesion occurred in the last 48 hours
- a unisegmental lesion
- first access to an emergency room.

The exclusion criteria were:

- polytraumas
- children that had an Orthopedic diagnosis in other Hospital and that came to our Hospital for a second opinion
- children with neurological lesions associated.

The diagnosis was made in all cases by physical examination, and plain radiograph; no CT scan or MRI were required in any case.

Descriptive statistics were calculated and presented in terms of means plus or minus deviation and frequencies with percentage for continuous and categorical variables, respectively. Mann-Whitney test and Chi-squared or Fisher test were used to compare the clinical characteristics between the two periods (2019 and 2020) of interest. The results were synthesized by mean of tables and graphics. A p-value of 0.05 was considered significant. The analyses were performed with R software (version 3.5.2).

Results

In 2019 there were 261 access to emergency room, in 2020 69: during lockdown the reduction was of 75%.

In table 1 are summarize the results concerning: sex, anatomical site of trauma, kind of lesion, with no evidence of statistic significance; about the place in which the trauma occurred there was a significant value, with $p < 0.0001$.

Table 1

VARIABLE	CATEGORY	2019	2020	PVALUE
N. Group	.	261	69	
Anatomical site	Lower limb	94 (36.15)	19 (27.54)	0,1412
	Upper limb	144 (55.38)	47 (68.12)	
	Spine	22 (8.46)	3 (4.35)	
Kind of lesion	Fracture	68 (26.05)	29 (42.65)	0,0003
	Contusion, sprain	118 (45.21)	19 (27.94)	
	No traumatic event	43 (16.48)	3 (4.41)	
	Hospitalization	15 (5.75)	6 (8.82)	
Side	Other	17 (6.51)	11 (16.18)	
	Right	131 (55.04)	30 (45.45)	0,2177
	Left	104 (43.70)	36 (54.55)	
Place in which trauma occurred	Right/left	3 (1.26)	0 (0.00)	
	Trauma at home	61 (28.64)	56 (83.58)	<0.0001
	Sport trauma	61 (28.64)	11 (16.42)	
Sex	Trauma in other place	91 (42.72)	0 (0.00)	
	F	100 (38.46)	30 (43.48)	0,4486
	M	160 (61.54)	39 (56.52)	

In the boxplots the statistical significant data: age was significantly lower ($p < 0.0001$) in 2020 during lockdown (graphic 1) and the prognosis of the lesions got worse during it (graphic 2).

In graphic 3 there are the data about the percentage of the different kinds of lesion in the two periods, and the need of hospitalization for it.

In graphic 4 we can see that 83.58% of trauma during lockdown occurred at home, and also the trauma deriving from sport, 16.42%, occurred in home's gardens or terraces, were children used bicycles or rollerblades. In the same month the year before only the 28.64% of traumas were at home, and the sport trauma occurred during training in gym and competitions, especially during soccer and basket. 42,72% of trauma in other places occurred at school or were road accidents.

During lockdown upper limbs were involved in 68.12%, and lower limbs in 27.54%, but the year before the difference between upper and lower limbs was inferior: 55.38% and 27.54%.

Discussion

The 10 million annual visits to United States pediatric emergency departments are composed of approximately 12 percent by musculoskeletal injuries [4,5]. A significant proportion of these injuries is occupied by skeletal fractures, which cause considerable cost and morbidity to children. The overall rate of fractures is said to be increasing, despite the recent aggressive campaigns for injury prevention [4,6].

The p value for the age was $p < 0.0001$: during lockdown younger children were more interested. The lockdown reduced all the trauma occurring during school time or sport: the elder children, staying at home, probably spent their time at the play station, watching TV or following lessons online, whereas the babies could run also in small apartments, jumping up and down from couches and beds.

No statistically significance about the body's region affected by trauma, nor for sex or trauma's side.

In 2020 trauma were represented mainly by fractures: 42.65% versus 28.05%, $p < 0.0003$, while a large number of access for minor trauma was described in 2019. During growth, it is difficult for children to remain fracture-free [7].

Clavicle fractures are typically caused by a fall into the shoulder, and it's typical in toddler falling down from the bed or from the couch.

The most common fractures in children are the forearm ones, accounting for 40 to 50 percent of all childhood fractures [3,8,9,12]. Considering the most common locations for fractures, the distal third of the forearm, involving the radius and/or ulna, accounts for about 75 percent of forearm fractures and 20 to 25 percent of all pediatric fractures [10,11]. The increasing body mass of children during their growth and development, in relation to an overall decreased bone mineral content can explain the high incidence of this type of fracture [6,9]; most of those will occur in children over five years old (peak age 10 to 14) [5,6,10].

Supracondylar fractures, that in up to 70 percent of patients result from a fall on an outstretched arm, comprise more or less the 60 percent of pediatric elbow fractures, and occur most frequently in children between 5 and 10 years of age. For what concerns older children, the majority of fractures result from higher falls from playground equipment (eg swings, monkey bars) or other high energy mechanisms.

According to the Sports and Fitness Industry Associations, approximately 11 million children of age from 6 to 17 rode a bicycle at least once during 2018 in the U.S. [13]. Even though regular bicycle riding (ie, ≥ 25 times per year) among children of this age declined between 2014 and 2018, bicycles continue to be one the main causes of childhood injuries, rather than other consumer products except automobiles [13].

The access to emergency room during lockdown was mainly made for fractures and more severe traumas than the precedent year, and this can be demonstrated by the $P < 0.0149$ for the days of prognosis for 2020's traumas. As a consequence of this, also the percentage of ospitalization for trauma was higher during lockdown.

Also Christey and Hermingou demonstrated a reduction of trauma frequency, but only of 32%, for staying home during Covid 19 pandemic. [14,15].

In our study the accidents occurred in 83.58% at home, $p < 0.0001$, 16.42% were sport related in particular in home's gardens or terraces, were children used bicycles or rollerblades.

Conclusion

In our study we find a statistical significant difference between the routine accesses to Pediatric Emergency Room in a second level Children's Hospital and the ones in an extraordinary event as the lockdown due to the Sars CoV 2 Pandemic in relation to age of patients, and severity of Orthopaedic trauma. No significant differences between sex of the patients, side of trauma, and anatomical site.

The volume of the accesses for trauma during lockdown was decreased of 75%, it means that to avoid the potential risk of Covid's infection in Hospital, only children with major trauma were brought there by parents, while the ones with contusions and sprains remained at home.

Declarations

Ethics approval

The study was approved by th Ethics Commitee of the Policlinico of Bari Hospital

Consent to partecipate

The parents or guardians gave free and informed consent

Consent for publication

All the authors have given the consent for pubblication

Availability of data and material

The data is stored for any classification

Conflict of interest/Competing interests

No conflicts of interests

Funding

Authors contributions

Daniela Dibello and Federica Pederiva conceived the study, Antonio Colella and Marcella Salvemini collected the data, all authors contributed intellectually to the interpretation of the data, participated in manuscript development and approved the final version

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Figures

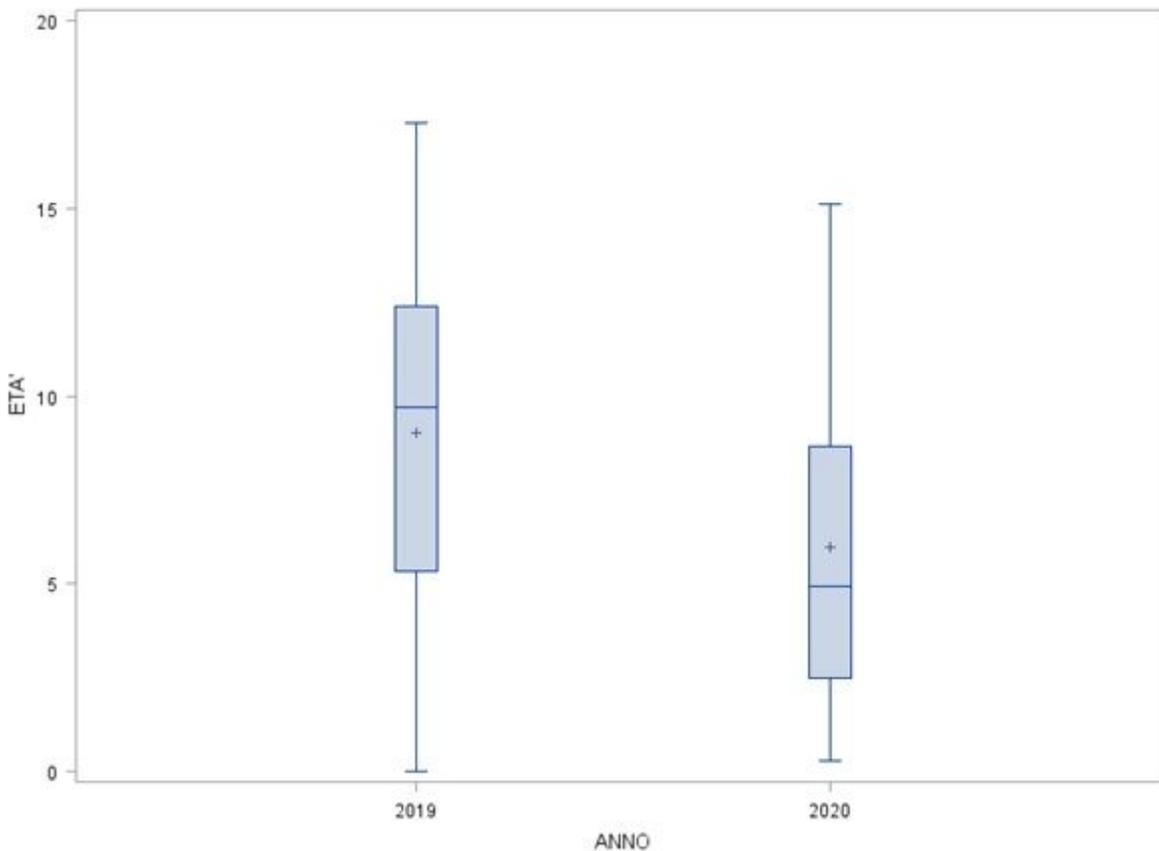


Figure 1

boxplots

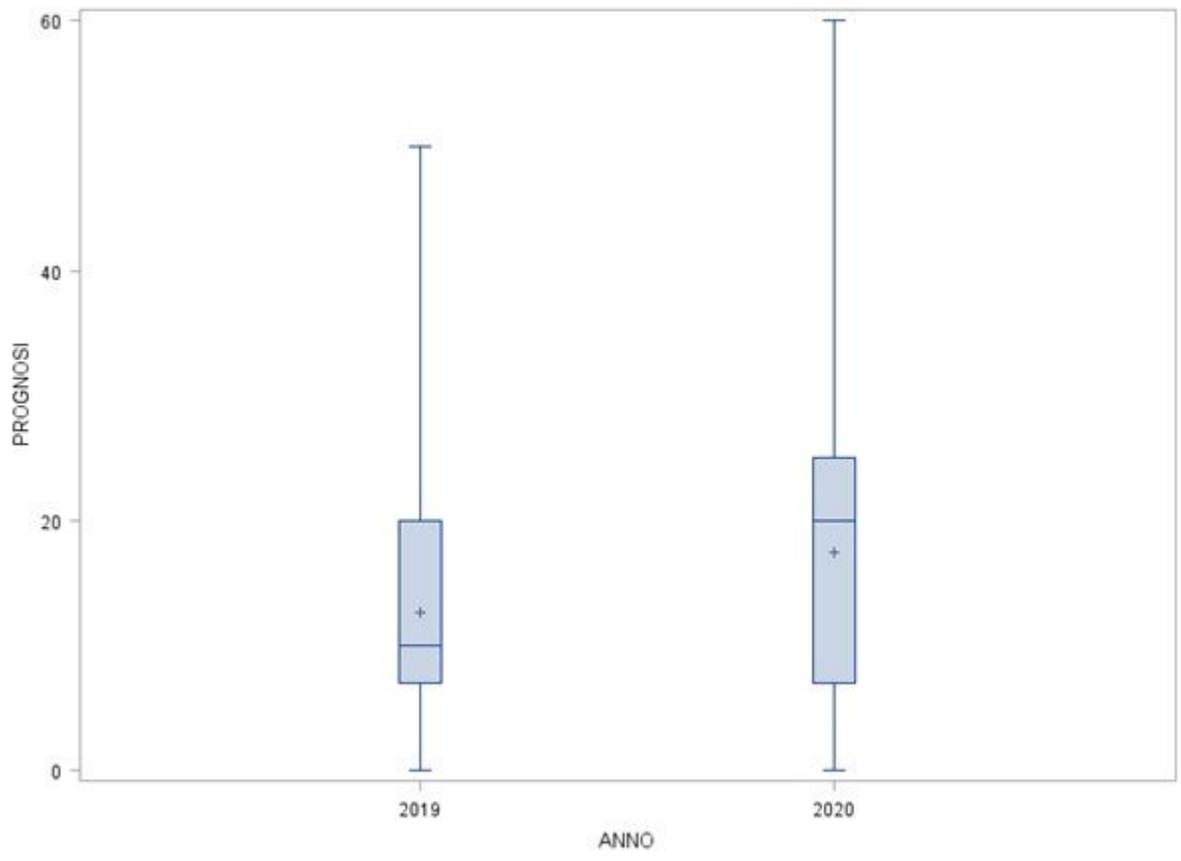


Figure 2

boxplots

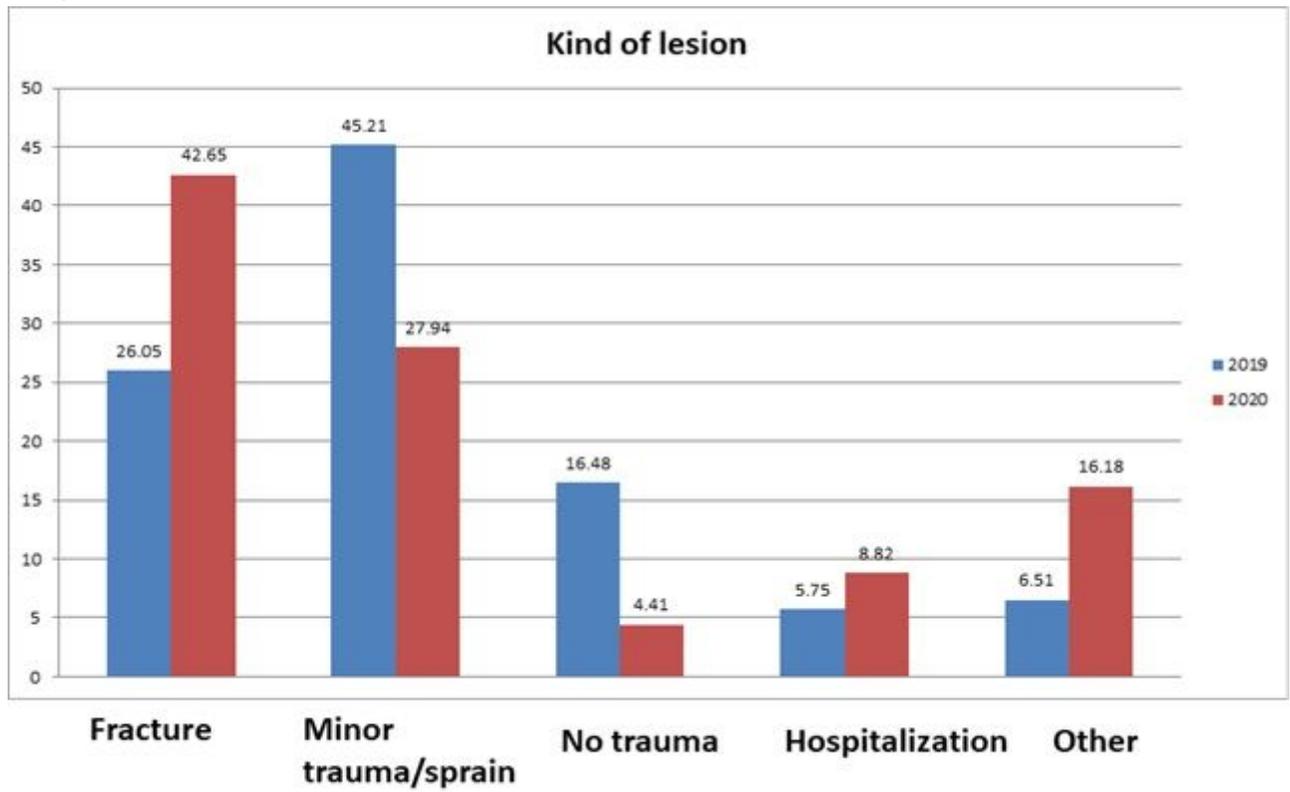


Figure 3

kind of lesion

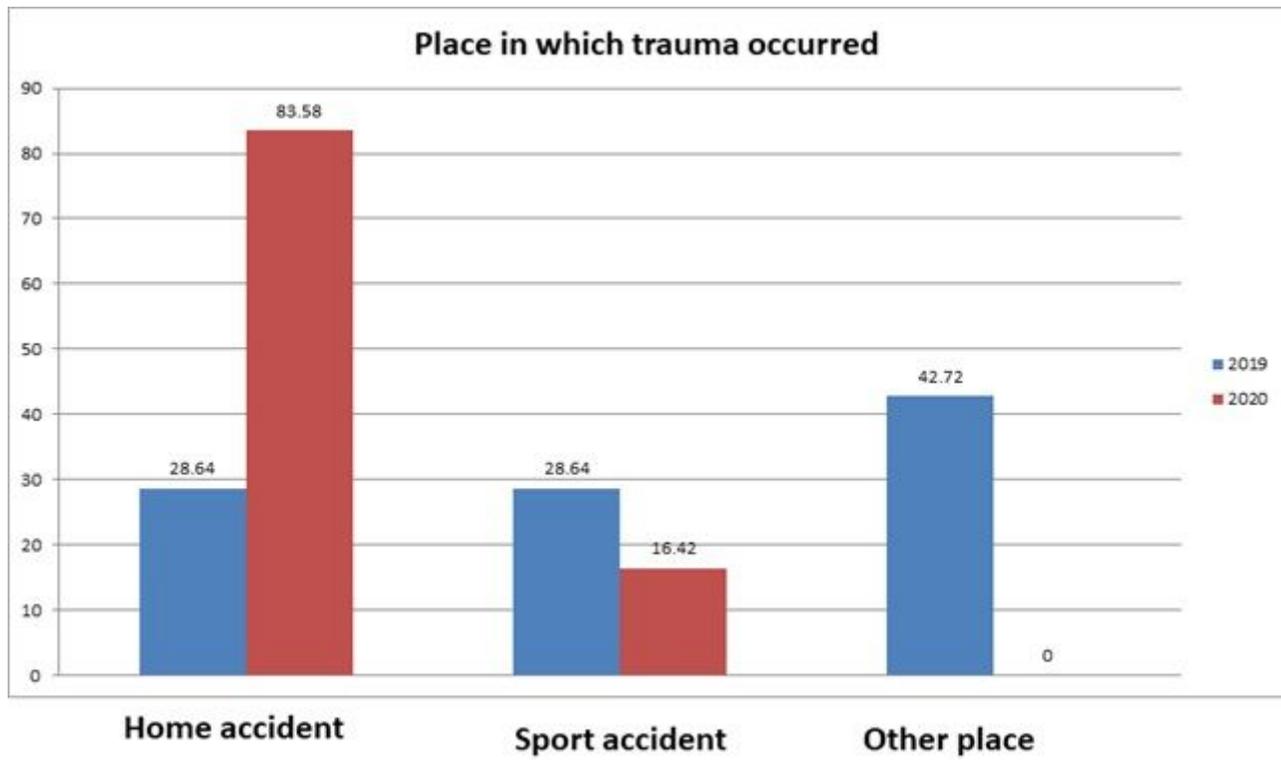


Figure 4

place in which second trauma occurred

Anatomical site

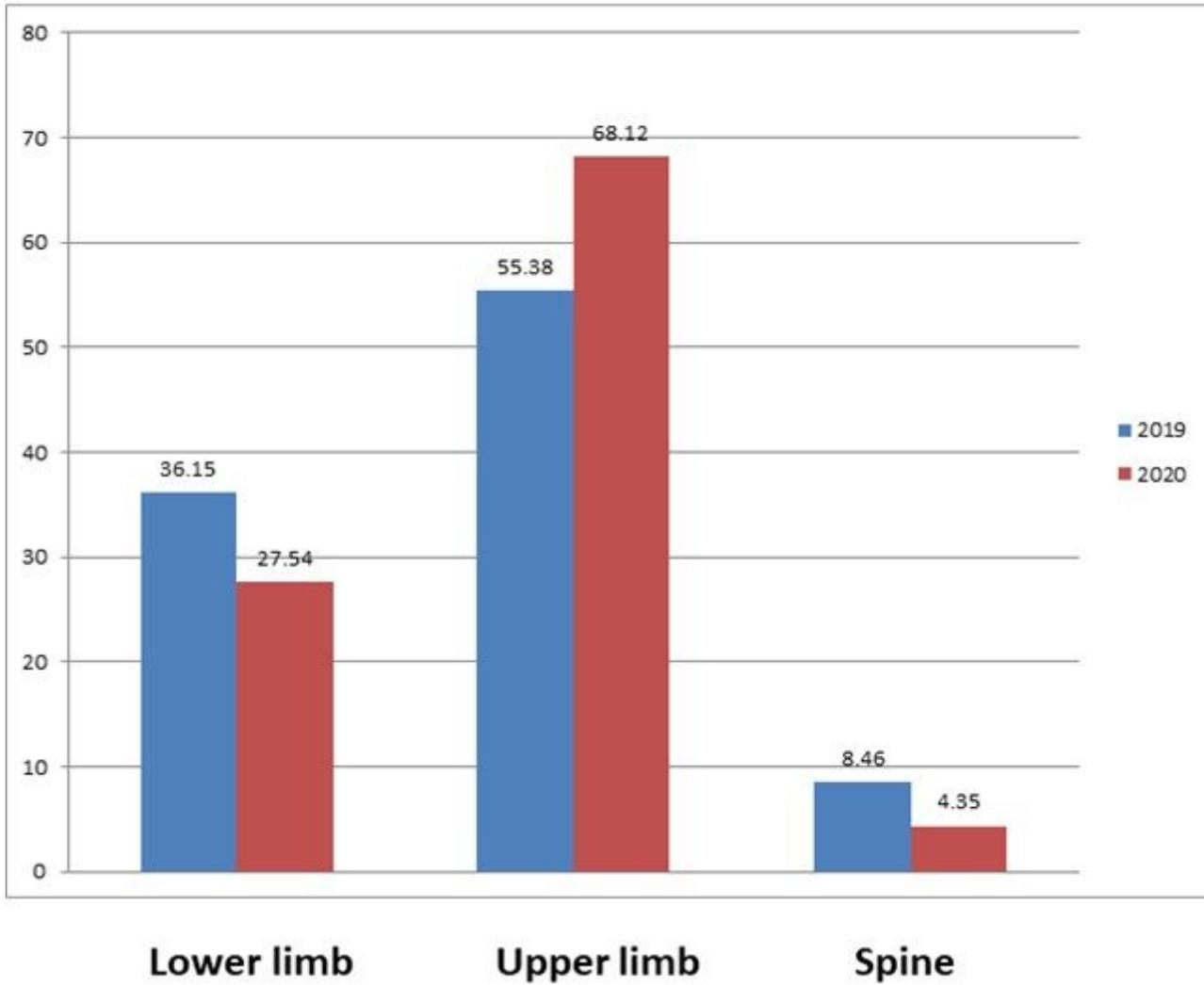


Figure 5

anatomical site