Consequences of COVID-19 Lockdown on Children and Their Pets: Dangerous Increase of Dog Bites Among the Paediatric Population

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Research

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Abstract

Introduction: SARS-CoV-2 pandemic has not only put our national health systems to the test, but it also notably hit the economy, the society and the psychology of the people. Our pets have been subjected to the pandemic related stress too.

The aim of the study is to evaluate whether the stress induced on domestic dogs resulted in an increase of dog bites in the paediatric population.

Material and Methods: A retrospective study was conducted on all patients admitted to our paediatric emergency department for dog bite from January 2014 and December 2020.

We compared the total mean dog bites of the years 2014-2019 and the mean number per single month with the respective 2020 data. The bites were divided between ones from family dogs and ones from stranger dogs.

Categorical variables were studied with Chi squared test considering statistically significant a p value < .05.

Results: From January 2014 to December 2019, we recorded a mean of 41 ± 7 dog bites (range: 35-55) of whom a mean 10 ± 4 (range: 4-15) were due to family dogs (24%) and a mean of 31 ± 2 (range: 28-35) due to stranger dogs (76%); the male:female ratio was 3:2, the 43% of the injuries concerned the head and face, 26% the lower limbs, 25% the upper limbs, 3% the genitalia and 3% the torso.

From January 2020 to December 2020 22 children were admitted for dog bites: 14 were from family dogs (64%) and 8 from stranger dogs (36%); the male:female ratio was 14:11, the 72% of the injuries concerned the head and face, 16% the upper limbs, 8% the lower limbs and 4% the torso.

The frequency distribution of family and stranger dogs' bites in 2014-2019 and 2020 was statistically significant (p : .002).

Between 2014 and 2019, a mean of 9 ± 2 (range: 6-12) of the wounds needed to be sutured (22%) while 32 ± 3 (range: 28-35) wounds were discharged after application of Steri Strips (78%).

On the other hand, in 2020, 13 wounds needed to be sutured (59%) and 9 received Steri Strips application (41%).

The frequency distribution of the treatments required (stitches vs Steri Strips) between 2014-2019 and 2020 was statistically significant (p : .003).

Conclusion: The number of family dog bites in children increased in 2020 especially during the lockdown period. Paediatrician should pay a lot of efforts nowadays more than ever to educate parents on always supervising their kids when playing with dogs.

Introduction

From late 2019 the entire World is facing the COVID-19 pandemic.

Italy was and still is one of the states most affected by the SARS-CoV-2 pandemic.

The pandemic has not only put our national health system to the test by saturating intensive care units all across the country but had, is having and will have serious repercussions on our economy, society and psychology.

Not only humans have been subjected to pandemic stress: our pets too.

Therefore, the aim of the study is to evaluate whether the stress induced on domestic dogs resulted in an increase in dog bites in the paediatric population suggesting us to pay more attention on the interaction between our kids and dogs.

Material And Methods

A retrospective study was performed on all patients conducted to our paediatric emergency department for dog bite from January 2014 and December 2020.

We compared the mean total dog bites per year between 2014–2019 and their single month mean number with the respective data from 2020.

The injuries were divided in ones due to family dogs and ones to stranger dogs. Chi squared test was applied considering statistically significant a p value $< .05$. Data are reported as mean $\pm$ standard deviation.

General characteristic of the population was taken in account like sex, mean age of the patients and the anatomic site of injury divided in head and face, upper and lower limbs, torso and genitalia.

Results

From January 2014 to December 2019, we recorded a mean of 41 ± 7 dog bites/year (range: 35–55) of whom a mean 10 ± 4 (range: 4–15) were due to family dogs (24%) and a mean of 31 ± 2 (range: 28–35) due to stranger dogs (76%); the male:female ratio was 3:2, the mean age of patients was 6.4 ± 3.5 years (range: 8 months – 13 years), the 43% of the injuries concerned the head and face, 26% the lower limbs, 25% the upper limbs, 3% the genitalia and 3% the torso (Fig. 1A).

From January 2020 to December 2020, 22 children were admitted for dog bites: 14 were from family dogs (64%) and 8 from stranger dogs (36%); the male:female ratio was 14:11, the mean age 5.2 ± 3.7 years (range: 9 months – 13 years), the 72% of the injuries concerned the head and face, 16% the upper limbs, 8% the lower limbs and 4% the torso (Fig. 1B).

The frequency distribution of family and stranger dogs' bites in 2014–2019 and 2020 was statistically significant (p : .002).

Between 2014 and 2019, a mean of 9 ± 2 (range: 6–12) of the wounds needed to be sutured (22%) while 32 ± 3 (range: 28–35) wounds were discharged after application of Steri Strips (78%).

On the other hand, in 2020, 13 wounds needed to be sutured (59%) and 9 received Steri Strips application (41 %).

The frequency distribution of the treatments required (stitches vs Steri Strips) between 2014–2019 and 2020 was statistically significant (p : .003).

Discussion

The SARS-CoV-2 pandemic has severely affected the entire world population.

Health systems around the world have been severely tested, but Coronavirus was not just a hospital affair.

The pandemic has had and will continue to have serious repercussions on world economies which have probably experienced one of the most serious setbacks of the contemporary history [1].

Moreover, the consequences on mental health of the world population will be equally serious, with increase of isolation, depression and anxiety disorders [2].

Even if they are rarely mentioned, we should not forget that our pets are also included in this anomalous situation.

The main public health measure to limit the virus spread imposed by almost all the states most severely affected by Coronavirus was the "Lockdown": the order to stay at home except for fundamental needs [3].

This meant that entire families remained at home increasing the sharing of spaces with their pets and their greater exposure to children that interact with the animals not always supervised by adults.

Bowen J. et al studied how the confinement affected the human-animal bond during Spanish lockdown: their results showed that the owners of pets declared that during the confinement the closeness to their animal helped them overcoming isolation and sadness [4].

On the contrary, the confinement seemed to affect negatively the quality of life of dogs: the commonest behavior problems that quickly got worse during lockdown were annoying or excessive vocalization and fear of loud or unexpected noises.

Moreover, the pets' owners reported also higher incidence of the subsequent behavioral problems: attention-seeking, irritability and more excitable tendency, frustration and stress.

The main explanation of the behavioural worsening of dogs during Lockdown are surely the reduction on number and duration of walk per day, forcing them to stay the most of time in a close environment like home where they are also overexposed to children which may or may not be supervised by adults.

An aspect that should not be underestimated is that during confinement Caregivers have the additional stress of children staying at home 24 hours a day, 7 days a week, for months without the possibility of out-of-home activities (school, playdates, parks, ...) and dog may experience "emotional contagion", a state in which companion dogs mirror the emotions and stress levels of their human caregivers [5].

Dixon et al. are the first and only ones in literature that described an increase of dog bites from March to May 2020 during the confinement in the USA, but they analysed just the first wave of Coronavirus outbreak [6].

With our data we show the entire 2020 fashion of dog bites in Bologna, an Italian city, one of the countries with the most severe confinement regulation.

Considering the average number of dog bites in the period between 2014 and 2019 and the number of bites that occurred in 2020 (41 vs 22), it would seem that the number of these events has decreased (*Fig. 2*).

Actually, these data must be read with extreme attention: the number of dog bites in 2020 would seem lower only because the number of strangers dog's bites has been drastically reduced by 40%. Stranger dog bites are typical to occur on the street or at the parks and playgrounds, places children have been less exposed to due to confinement; this explains the decline previously exposed in the total number per year.

The worrying aspect, however, is the notable increase in bites by family dogs, which increased by 40% compared to the 2014-2019 average ($p .002$).

Perhaps, even more alarming is the significant ($p .003$) increase in the number of wounds that needed to be sutured, an expression of greater violence exerted by the dog during the act of biting, not to mention the higher incidence of bites that injured the face (72% in 2020 vs 43% between 2014-2019) of the patients resulting in unesthetic scars.

Analysing the number of bites per month, as shown in *Fig. 3A*, it is possible to see how two of the highest peaks of incidence of bites from family dogs are located during the two lockdowns Italy underwent in 2020; equally remarkable is that, even if decreasing, the relative number of bites per month from dogs to their paediatric owner maintains always higher compared to the ones of 2014-2019.

Furthermore, even the third peak located in between the two lockdown periods could be easily explained as follow.

Holland KE et al demonstrated in their paper that spending extra time with our dog(s) may negatively impact on the animal's future ability to cope when left alone [7]. In fact, dropped the restriction and returned to routinary life, the dogs may have experienced the stress and frustration derived by their reduced autonomy becoming, therefore, more aggressive.

In figure 3B is shown the lower relative number of bites per month from stranger dogs that had a peak during summer 2020, when the restrictions were abolished (except for face masks and social distancing).

What the data of the present study is telling us is that now more than ever we need paediatricians and healthcare providers in general as public health professionals too to increase efforts for preventions in order to reduce the number of dog bites.

Therefore, we have the duty to educate parents of children, especially ones from 5 to 9 years old that have higher risk of dog bites (confirmed by our data too), reminding them that the most important prevention of dog bites is to always supervise infants and children when they are near a dog [8,9].

For this purpose, we present here a list of tips to avoid dog bites diffused by the American Academy of Pediatrics (Table 1) and already reminded by Dixon et al; we suggest sharing extensively this table with parents of children and owners of dogs [6].

Conclusions

The number of bites coming from family dogs is drastically growing due to the negative effect that confinement has on the animals.

Health care providers and paediatricians have the duty to stress the attention on this undesirable and dangerous event with parents, especially ones of young children, as long as SARS-CoV-2 requires restrictive measures like lockdowns.

This topic is of particular importance and awareness is required between paediatricians and paediatric surgeon reminding that prevention is the only way to reverse a phenomenon that risks becoming exponential.

Declarations

- Ethical Approval and Consent to participate: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of IRCCS Sant'Orsola Malpighi University Hospital (CHPED-03-21-DOG).

- Consent for publication: Written informed consent has been obtained from the patient(s) to publish this paper.

- Availability of supporting data: Data supporting reported results can be asked to the corresponding author.
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Tommaso Gargano: Second author. Contributions to the conception of the work, revised it critically for important intellectual content; final approval of the version to be published; agreement to be accountable for all aspects of the work.

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Mario Lima: Last author. Substantial contributions to the conception and design of the work and revised it critically for important intellectual content; final approval of the version to be published; Agreement to be accountable for all aspects of the work.

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Figures

Figure 1

Anatomical distribution of the sites of bites

Figure 2

A. Number of dog bites and sutured ones (the number of 2014-2019 is an average value); B. Relative number of dog bites divided in derived from family dogs and from stranger dogs

Figure 3

Relative number of dogs' bites. The red areas represent the two Italian lockdown periods

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