

Perspective

Pets and Pediatrics, Friend and Foe: Companionship Masking Illnesses

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Abstract

Animals are companions that have continued to hold importance in the average American household. Traditional animals like dogs and cats are often treated as family members due to the human-animal bond. Although it seems as if there are many benefits to having animals in the home, it comes at a price—pet-borne illnesses. Compared to adults, the pediatric population is at a greater risk for these types of illnesses. Animals are natural reservoirs for many bacteria that may be passed to children, especially those who are immunocompromised. The goal of this article is to educate parents on the risks and symptoms of common pet-borne illnesses that are difficult to prevent from coming into the home.

Introduction

Animals are companions that have continued to hold importance in the average American household. Traditional animals like dogs and cats are often treated as family members due to the human-animal bond. This bond has been recognized by the American Veterinary Medical Association as impacting the well-being of the person and the animal [1]. Research has shown that traditional household animals have reduced loneliness and rapidly created a positive impact on human mental wellness [2]. Transitioning to a more pediatric-centered focus on having animals in the home, little research had previously been conducted on the impact animal companionships have on children. Recently research has shown that pet ownership may be beneficial to a child's emotional, cognitive, behavioral, educational, and social development [3].

Although it seems as if there are many benefits to having animals in the home, it comes at a price—pet-borne illnesses. Compared to adults, the pediatric population is at a greater risk for these types of illnesses. Children are at risk because they may not have received all childhood vaccines when exposed to an animal and have an immature immune system. Children are also at risk of getting bitten by a familiar animal due to their activity and increased energy compared to adults, which may trigger animals to become defensive.

Perspective

“Traditional” pets are very common in America with more

than 65 million households owning a dog and over 45 million households owning a cat [4]. Although these animals have become our furry friends, they carry a huge risk of disease to children. More specifically, dogs can spread many bacteria to small children. Some of the most significant ones that parents must be aware of are *Campylobacter jejuni*, *Clostroides Difficile*, and *Pasteurella*.

Puppy owners are especially at risk for infection with *Campylobacter jejuni*. The dogs are not all to blame for this colonization, though, because dogs normally become colonized with *campylobacter* due to being fed with homemade kitchen scraps. The infected animal then becomes a reservoir of infection for the child [5]. The common symptoms of *campylobacter* in a child include diarrhea, fever, and abdominal pain. Bacteremia usually occurs after gastroenteric symptoms in children. Bacteremia does not last long due to host responses. In children who may be immunocompromised or not yet have developed an effective immune system due to age, recurrent episodes of bacteremia may occur [6].

Children may be heavily exposed to licks and “kisses” from dogs, which could easily transmit *Clostridium Difficile*. This bacterium would also present with diarrhea and stomach cramps due to inflammation of the colon [7].

More Information

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Pasteurella species are seen in the normal flora of the upper respiratory tract of both dogs and cats. Scratches from dogs and cats may also transmit the bacteria. The most common symptom that may be seen in a child who has been infected by the *Pasteurella* species is a soft tissue infection like cellulitis. Meningitis, osteomyelitis, and respiratory tract infection may also develop [8].

Although the *Pasteurella* species may be passed to children from both dogs and cats, other bacterial species are much more specific to cats. *Toxoplasmosis gondii* is one of the most common pathogens in cat-to-human transmission. Eating or accidentally swallowing food that may have been contaminated with cat feces is the most common way to acquire Toxoplasmosis. Children are at an especially high risk of acquiring this infection due to their curiosity and the possibility of accidentally touching the litterbox. Symptoms will present like the flu or mononucleosis with fever, lymphadenopathy, body aches, and weakness [9]. Cats are also a natural reservoir for the *Bartonella* species, as they become infected from bites of infected fleas or contact with bodily secretions from other cats who may be infected. According to the CDC, *Bartonella* is seen in the blood of 1/3 of healthy cats, especially kittens [7]. If a child becomes infected with *Bartonella*, symptoms may include enlarged, tender lymph nodes that develop 1 week - 3 weeks after exposure, a scab or pustule at the infection entry site, and endocarditis. Illness is most seen in children under the age of 15 years; however, it is important to remain watchful if your child is immunocompromised [10].

While traditional pets are by far more common in the United States, nontraditional pets are increasing in popularity. A survey conducted in 2011 estimated that 11% of US households owned "exotic" or specialty pets [4]. Examples of nontraditional pets are fish, rodents, birds, reptiles, insects, and many others. These species raise public health concerns especially when considering interaction with small children who have immature immune systems.

Reptiles and amphibians are common household pets that have a high carriage rate of *Salmonella*. In the United States, about 6% of sporadic *Salmonella* infections are a result of direct or indirect contact with reptiles or amphibians [11]. *Salmonella* is naturally found in the intestinal tract of many animals and infected animals often appear healthy but can shed the bacteria. In children, symptoms of *Salmonella* infection include but are not limited to acute self-limiting gastritis, bloodstream infections, or asymptomatic carriage [12]. If a child is around a reptile and begins to present with signs or symptoms of fever or sepsis, a visit to the doctor is necessary, especially because antibiotic treatment may or may not be indicated depending on the age of the child and individual risk factors. *Salmonella* can cause meningitis and brain abscesses in children who may be immunocompromised, and these children have a 32% increased chance of becoming very ill from this infection [12].

Rodents like hamsters, guinea pigs, and hedgehogs have recently become popular household pets in the US. These animals can spread *Yersinia petis* to children through bites from infected fleas, inhalation of respiratory secretions from infected rodents, or just handling an infected rodent. *Yersinia petis* can cause plague including symptoms of abrupt onset fever and chills, headache, weakness, and one or more swollen painful lymph nodes called buboes. Along with plague, these rodents, specifically hedgehogs, pose a significant threat to the spread of a skin infection caused by *Yersinia pseudotuberculosis* due to their spines which can readily penetrate the skin [13]. *Yersinia* species is common in the United States and is mostly localized to Arizona, California, Colorado, and New Mexico [10].

Conclusion

This article serves to educate parents on the risks and symptoms of common pet-borne illnesses that are difficult to prevent from coming into the home. Animals are natural reservoirs for many bacteria that may be passed to children, especially those who are immunocompromised. It is important, as parents, to remain aware of the signs and symptoms or pathogens related to animals that may be living in the home and have a great deal of contact with children.

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