

ARE SKIN DISEASES IN SCHOOL CHILDREN RELATED TO KEEPING OF ANIMALS IN HOMES?

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ABSTRACT

Background Families in Jos keep animals in the home vicinity for various reasons such as companionship, security, nutrition, and financial support. Children in such homes live in close proximity with such animals. The skin being the outermost organ to interface with animals may be exposed to infections and allergens. There is therefore a need to determine the proportion of children in the population who are exposed to animals in their homes, and to describe any relationship with skin diseases.

Objectives The study was carried out to investigate the proportion of school children in close contact with animals and the relationship between skin disease and presence of such animals in homes.

Methods This was a descriptive cross sectional study of 390 (aged 6–12years) children of primary schools in Jos North Local Government Area of Plateau state, Nigeria. Clinical diagnosis of skin disease was made from information on, disease symptomatology and examination of skin, hair and nails of respondents. Diseases were grouped into Infectious skin diseases (fungal, bacterial, viral and ectoparasitosis), dermatitis, urticaria and others. Data was analyzed using SPSS version 21.

Results The proportion of school aged children that had animals at home were 77.2 % (301 of 390). The prevalence of skin diseases in the school children was 36.2% (141 among 390). There was no statistically significant difference ($p=0.144$) in the occurrence of skin disease among those that kept animals 34.2%(103 of 301) and those that did not 42.7%(38 of 89). However there was a statistically significant difference in the pattern as children who had animals in their homes were observed to have more infectious skin diseases and

less urticaria and dermatitis (p=0.001)

Conclusion A large proportion of families with children keep animals in the vicinity of the homes and this may affect the type of skin diseases children present with. Simple personal hygiene should be taught to children and practiced at home after contact with animals

Keywords: Skin diseases, animals, zoonosis, children

INTRODUCTION

Humans have domesticated animals for various reasons such as hunting, protection, livestock and company (pets).^{1,2} The practice of keeping animals within the vicinity of human dwelling is practiced globally across different races, cultures and socioeconomic class. Studies from developed nations have reported large proportions of their populations keeping animals. Between 56–68 % of households in Canada and the United States keep pets in their homes.³⁻⁴ In Africa, a growing livestock-keeping practice in and around urban centers as a way to supplement income and diet has also been reported.^{1,2,5} This relationship involving humans and animals living in close proximity with each other exposes humans to zoonotic diseases which can range from self-limiting skin conditions to life-threatening systemic illnesses.

The skin is the outermost organ to interface with animals and may be exposed to infections and allergens from such contacts. Animals have transmitted infective organisms to humans causing specific skin diseases such as Tinea (capitis, corporis), scabies and pyoderma.^{6,7} They may also be the source of proteins that trigger dermatitis or urticaria while on the other hand it has been suggested that early exposure to animals in childhood is associated with a reduced risk of subsequent allergic skin disease.^{6,8,9}

Groups well known to have greater exposure to animals and thus zoonotic infections include livestock handlers, agriculturists, veterinarians and abattoir workers. Young children with their relatively immature immune system may be at increased risk of contracting cutaneous zoonotic infections.¹⁰ There is therefore a need to determine the proportion of children in the population who are exposed to animals in their homes, to describe their demographics and possible relationship between keeping animals and occurrence of skin diseases

METHODOLOGY

This was a cross-sectional study conducted among 390 (aged 6–12 years) children of selected private and public schools from Jos North Local Government Area of Plateau state from August–October 2013. The study was approved by the Research and Ethical Committee of the Jos University Teaching Hospital. Informed consent was obtained from parents/guardians and assent from the child was also sought and obtained. Information on Biodata, school attended, type of animals kept at home, and disease symptomatology was obtained. Socioeconomic status was determined by application of the scoring system designed by Olusanya and classified as upper, middle and lower Socioeconomic class. Key diagnostics features were used for clinical diagnosis of major skin diseases

after full examination. Skin diseases were grouped into Infections, dermatitis, urticaria and others. Animals were classified as pets(those kept for sentimental and guard purposes such as dogs and cats), poultry (any avian species kept for eggs, meat and sales) and livestock(mammals raised in a formal or informal agricultural setting kept for meat, milk, wool, fur and sales).A hand lens and 12 mega pixel camera was used to view and capture skin lesions for detailed review. Data was analyzed using SPSS version 21.

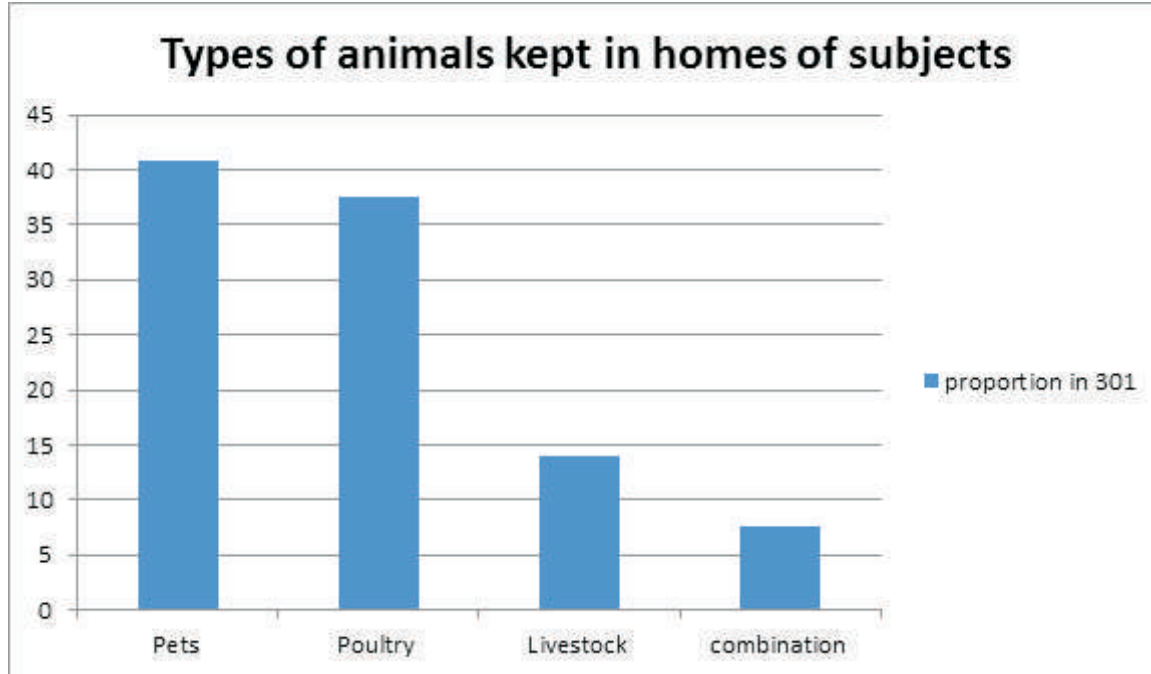
RESULTS

Of the 390 pupils sampled, 301 children (77.2%) were from households who kept animals and 89(22.8%)did not. Twelve animal types were kept within the premises of the house. They were classed as Pets (dogs, cats), free range and caged poultry

(turkey, chicken, quails, pigeon, duck) and livestock (rabbit, pig, goat, sheep, cow).

The prevalence of skin disease was 36.2% (141 of 390) among respondents. The spectrum of skin diseases observed were: Infectious diseases (Tinea,Pityriasis versicolor,Furuncle/carbuncles Folliculitis ,Impetigo Ecthyma, Molluscum contagiosum, Warts, Herpes simplex, Scabies, Pediculosis capitis), Dermatitis (contact, atopic and seborrheic), Urticaria– (acute and papular) and others– (acne, scars, lichen nitidus,cheilitis, disorders of pigmentation, Alopecia, Hypertrichosis Onchogryphosis)

Figure 1: Proportion of school children with animal type in their home



More than a third (40.9%) kept pets,37.5 % kept poultry,14% kept livestock and 7.6% kept various combination of animal types.

Table 1: Socioeconomic class (SEC) and type of school of children with animals in their homes

SEC	Types of animals kept				Total	X2	df	P
	Pets (%)	Poultry (%)	Mammal Livestock (%)	Combination (%)				
Low	30(36.1)	34(41.0)	13(15.7)	6(7.2)	83	3.169	6	0.787
Middle	60(40.5)	53(35.8)	22(14.9)	13(8.8)	148			
Upper	33(47.1)	26(37.1)	7(10.0)	4(5.7)	70			
Total	123(40.8)	113(37.5)	42(14.0)	23(7.6)	301			
Type of School								
Public	49(34.0)	70(48.6)	16(11.1)	9(6.3)	144(100)	14.46	3	0.002*
Private	74(47.1)	43(27.4)	26(16.6)	14(8.9)	157(100)			

The commonest animals kept in homes of children from upper and middle SEC were Pets (47.1% and 40.5%) while Poultry (41%) was commonest in lower SEC. The least type of animals kept by all SEC

was livestock. More children attending private schools had household pets (47.1%) while more children attending public schools kept poultry (48.6%). The differences were statistically

Table 2: Relationship between keeping of animals and presence of skin diseases in general

Presence of skin disease	Keeping of animals			X2	df	p
	Yes	No	Total			
Present	103(34.2)	38(42.7)	141	2.139	1	0.144
Absent	198(65.8)	51(57.3)	249			
Total	301	89				

There was no association between skin disease as an entity and keeping of animals P=0.144

Table 3. Relationship between keeping of animals and presence of specific types skin diseases

skin disease group	Keeping of animals			X ²	df	p
	Yes	No	Total			
Infections(n=87)	63(72.4)	24(27.6)	87(100)	18.415	2	0.001*
Dermatitis(n=38)	17(44.7)	21(55.3)	38(100)			
Urticaria(n=11)	2(18.2)	9(81.8)	11(100)			
Infectious skin diseases						
Fungal n=46	32(50.8)	14(58.3)		0.029	1	0.865
Other-bact,viral, parasites(n=41)	31(49.2)	10(41.7)				
Total	63(100)	24(100)				

Infectious skin diseases were seen more in children whose family kept animals. While urticaria and dermatitis, were highest in children that kept no animal. (p=0.001). The difference was statistically significant (P=0.001). There was no statistically significant difference relationship between the type of infectious disease and type of animal kept (p=0.865)

DISCUSSION

A large proportion (77.2%) of children in Jos metropolis lived in homes that kept animals within the house and immediate vicinity. This is a common

practice in many developing countries and is a way of augmenting food/ protein supply, and income generation.² Our results showed that most animals kept in homes generally were pets with more children from upper Socioeconomic class (SEC) and in private schools reported having them. This is consistent with findings in other studies which showed pets being the commonest animals kept in urban areas in most counties.^{4,6}

Among all respondents seen, prevalence of skin disease was 36.2%. This is a significantly high proportion as about 4 in every 10 children had skin disease. There was no statistical difference in the

occurrence of skin diseases between children that had animals at home and those that did not, (34.2%vs42.7%, p=0.144). This is probably due to inclusion of all skin conditions that have no etiological relationship with animals such as acne or seborrheic dermatitis.

There was a wide spectrum of skin diseases observed among the school children. The infective skin disease group showed a greater variety than the other groups. This is expected of the disease pattern in the tropics where infectious disease agents and vectors thrive in the hot, humid conditions. When specific groups of skin diseases were analyzed, Infective skin diseases as a group were significantly more prevalent among children who kept animals (72.4% vs 27.6%,p=0.001) than in those without animals. Animal have been reported to be carriers or be infected by organisms such as Staphylococcus intermedius, Methillicin Resistant Staphylococcus aureus(MRSA), Dermatophytes and Sarcoptes scabiei.¹⁰⁻¹⁴ Thus persons who have close contact with animals such as pet owners have greater risk for colonization, local or systemic infection.^{5,6} Children particularly may be more at risk of zoonotic skin infections, firstly because of the of rigorous contact during play with domestic animals especially pets such that organisms are easily transmitted between the animals and children by inoculation. Secondly, the developing immune

system of children may put them at risk of acquiring any of the infective skin diseases from the animals.

Within the infectious disease group, fungal diseases occurred most commonly in both subject groups that kept animals and in those that did not, although there was no statistical significance. This could be on account of the relatively small sample size of each subgroup within the infectious diseases group such that the difference was not detected.

A well-recognized factor in exacerbating dermatitis and urticaria is protein from animal dander, hair, saliva and urine. Previous works have indicated that children who have regular contact with animals during early life have reduced risks of allergic sensitization when older.¹¹ This supports our findings of significantly lower occurrences of Urticaria and Dermatitis in pupils that had animals within their homes.^{7,8} On the other hand; there was significantly higher occurrence of dermatitis and urticaria in those that didn't keep animals. This could be explained by the 'Hygiene Hypothesis' where there is defective immune tolerance due to a lack of exposure to animal related allergen or microbial exposure in the environment by excessive cleanliness.¹²

CONCLUSION

The findings presented suggest a significant proportion of school children in Jos live in close

contacts with animals in their daily life and pets were the most common animals kept in homes. Almost 4 in every 10 school children had skin diseases in general (36.2%), which is quite significant. While the study does not show that keeping animals was associated with increased prevalence of skin diseases, it does show that keeping animals at home is associated with a pattern where infective skin disease occurred more, with less occurrences of dermatitis and urticaria.

RECOMMENDATIONS

In the light of these findings it is important for health practitioners to be aware of and utilize this knowledge in managing children presenting with skin lesions. School children and family members should be educated on best practices of keeping animals such as, routine veterinary checks sanitation, personal and house hygiene

The close relationship of humans and their animals calls for partnership between human and veterinary medicine. It also sets up a basis of collaboration between the Ministries of Health, Agriculture and Education for more research in zoonotic infections, and development of regulations for keeping animals within homes particularly near children.

The authors have no conflict of interest to declare.

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