

Does living in crowded houses offer protection against the development of inflammatory bowel disease?

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Abstract. – **INTRODUCTION:** The credibility of the “Hygiene hypothesis” in patients with inflammatory bowel disease has been assessed.

OBJECTIVE: This survey is aimed at finding an answer for the question: “Does living in crowded or overcrowded houses protect against the development of inflammatory bowel disease?”

PATIENTS AND METHODS: Asian immigrants to the United Kingdom who attended inflammatory bowel diseases’ clinics during the period of the study and who fulfilled Leonard-Jones criteria were asked to complete a questionnaire. The participants were asked to respond to questions on age, sex, their birth rank, diagnosis, & number of brothers, sisters, sons and daughters

RESULTS: 60% of the participants had four or more brothers and sisters. Forty per cent of the participants grew in crowded houses (occupied the fourth birth rank).

CONCLUSIONS: Our presented data do not support any role of the number of house inhabitants in the development of inflammatory bowel disease.

Key Words:

Crohn’s disease, ulcerative colitis, IBD, Hygiene hypothesis, Helminths, Asians.

Introduction

The “Hygiene hypothesis” proposes that increased prevalence of common chronic inflammatory disorders is the result of defective regulation of the immune system resulting from diminished exposure to some classes of microorganisms. Therefore, Better sanitation¹⁻⁵, lack of helminthic infestations⁶⁻¹⁵, and smaller family size and house inhabitants^{16,17} in the Western half of the globe were considered as possible reasons for the significant differences in the prevalence of inflammatory bowel diseases between the Westerns and Eastern nations. For assessing the credibility of this assumption we investigated this matter further.

Objectives

This study is aimed at finding answer for the following valuable question:

Does living in crowded or overcrowded houses protect against the development of inflammatory bowel diseases?

Patients and Methods

Asian immigrants to the United Kingdom who attended inflammatory bowel diseases’ clinics during the period of the study and who fulfilled Leonard-Jones criteria were asked to complete a questionnaire. The participants were asked to respond to questions on age, sex, their birth rank, diagnosis, and number of their brothers, sisters, sons and daughters.

Results (Table I)

Forty-Eight Asian immigrant patients who were diagnosed with either Crohn’s disease or ulcerative colitis, and fulfilled Leonard-Jones criteria participated in this survey (25 were males) Ulcerative colitis was diagnosed in 16 males and in twelve females but Crohn’s disease was diagnosed in nine males and in eleven females The number of patients who had four or more brothers and sisters amongst the participant was 29 (29 out of 48, 60.42%). In three instances out of them, the patients occupied the first rank (10.34%) The number of participants who had four sons and daughters or more was eleven (11 out of 48, 22.91%). The number of participants who occupied the 4th birth rank or later was 18 (18 out of the 48, 37.5%).

Table I. Family back ground of patients with inflammatory bowel diseases

Patient NO.	Sex	Diagnosis	No of brothers	No of sisters	Rank of patients	No of sons	No of daughters
1.	F	UC	2	2	5 th	1	2
2.	M	UC	2	2	3 rd	1	3
3.	F	CD	2	2	3 rd	2	1
4.	M	UC	6	2	8 th	0	0
5.	M	UC	1	1	2 nd	3	1
6.	F	UC	3	7	2 nd	2	0
7.	M	UC	3	3	1 st	3	0
8.	F	CD	0	0	1 st	1	1
9.	M	UC	5	2	3 rd	2	3
10.	M	CD	2	3	4 th	1	2
11.	M	CD	1	1	2 nd	1	1
12.	M	UC	0	2	2 nd	1	3
13.	M	UC	3	2	5 th	2	0
14.	F	UC	0	0	1 st	0	0
15.	F	UC	5	2	3 rd	0	2
16.	F	CD	2	2	1 st	2	2
17.	M	UC	1	1	2 nd	3	1
18.	F	UC	3	1	5 th	1	0
19.	M	UC	1	1	1 st	2	2
20.	M	UC	6	2	9 th	1	1
21.	F	UC	1	3	2 nd	3	3
22.	F	UC	2	2	5 th	3	1
23.	M	CD	2	4	5 th	1	2
24.	M	UC	4	1	4 th	1	2
25.	M	CD	3	1	3 rd	0	0
26.	M	UC	2	1	3 rd	3	1
27.	M	UC	0	1	2 nd	4	2
28.	F	UC	2	2	4 th	2	1
29.	M	CD	2	1	3 rd	2	1
30.	M	CD	4	1	4 th	2	1
31.	M	CD	1	5	2 nd	1	2
32.	M	CD	4	1	3 rd	2	0
33.	M	UC	0	2	3 rd	0	0
34.	F	CD	2	1	1 st	0	0
35.	F	UC	4	3	4 th	2	0
36.	F	CD	1	1	2 nd	0	0
37.	F	CD	1	0	1 st	0	0
38.	F	CD	1	2	4 th	0	0
39.	F	CD	3	2	2 nd	0	2
40.	F	CD	1	5	7 th	1	1
41.	F	CD	3	2	4 th	2	1
42.	F	CD	5	3	1 st	0	0
43.	F	UC	1	1	3 rd	0	0
44.	M	UC	2	0	1 st	0	3
45.	F	UC	2	0	3 rd	2	1
46.	F	UC	1	5	4 th	0	0
47.	M	UC	2	1	4 th	0	0
48.	M	CD	2	5	8 th	2	1

Discussion

During the 1980's and 1990's, both Strachan et al¹⁹ and Matricardi et al²⁰ noticed that having many siblings, especially older ones, was concomitant with a diminished risk of hay fever. These conclusions were considered steadfast with a protective influence of postnatal infection

that might be lost in the presence of contemporary hygiene¹⁸⁻²⁰. This assumption was then supposed to be providing an explanation for this mysterious development of inflammatory bowel diseases and its prevalence in the developed countries. However, recent reports from Asia suggest that the incidences of diagnosis of Crohn's disease and ulcerative colitis are increas-

Table II. Prevalences of helminthic infestations in Asian countries.

Study	Number of patients/participants	Percentage
Wani, SA et al, 2008 ²⁵ (Kashmir, India)	228/312	71.15%
Chandrasekhar MR et al, 2003 ²⁶ (India)	680/1000	68%
	Urban group: 284/500	56.8%
	Rural group: 396/500	79.2%
Ullah I et al, 2009 ²⁷ (Pakistan)	132/200	66%

ing. The lack of diagnosis in the past was thus likely to be due to lack of professional experience and/or the absence of the proper facilities⁽²¹⁻²³⁾. In our study, about forty per cent of the participants grew in crowded houses (patients occupied 4th birth rank or later). In addition, It has been estimated that 80% of the population of most countries in Asia, Africa, and south America are infected with helminths, such as, *Ascaris* and widespread infection has been demonstrated throughout Europe, Particularly, Romania, Hungary, Portugal, and Turkey²⁴. When three hundred and twelve children in the age group of 4-15 years were examined for different intestinal helminths in three schools located in rural areas in Kupwara, Kashmir, India, two hundred and twenty two of 312 (71.15%) tested positive for various intestinal helminths²⁵. The various helminth parasites included *Ascaris lumbricoides*, *Trichuris trichiura*, *Enterobius vermicularis* and *Taenia saginata*. The highest frequency of 69.23% (216/312) was noted for *Ascaris lumbricoides* followed by *Trichuris trichiura* 30.76% (96/312), *Enterobius vermicularis* 7.69% (24/312) and *Taenia saginata* 7.69% (24/312). Single infection was found in 33.65% (105/312) and mixed infection was seen in 37.5% (117/312) children. Again, Chandrasekhar MR and others in 2003²⁶ collected faecal samples from 1000 children below 6 years of age. 680 children (68.0%) were detected to have intestinal helminthic infection. The incidence of intestinal helminthiasis in urban group of children was 56.8% (284 out of 500 tested) while in rural group of children was 79.2% (396 out of 500 tested) both in rural and urban population *Ascaris lumbricoides* was the single predominant species, whereas a combination of *A. lumbricoides* and *Trichuris trichiura* was common multiple infection. All cultures of faecal samples were positive for hook worm ova. In Pakistan, out of 200 children examined, 132 (66%) were found positive for various intestinal helminths infestation²⁷. There were 6 different types of helminths found in the specimens exam-

ined. Thus conduction of infectious diseases during childhood did not protect against the development of inflammatory bowel diseases in endemic areas²¹⁻²³ (Table II).

Conclusions

Hygiene hypothesis cannot provide with a credible explanation for the development of Crohn's disease and ulcerative colitis.

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