INDIVIDUAL STUDY

Acute viral respiratory infections in a general practice during 1971

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RESPIRATORY infections account for a large proportion of the work of a general practitioner. Hodgkin (1965) found that during a period of four years 27 per cent of his work was due to acute respiratory disease and Howie *et al.* (1971) in a survey of 155 doctors in Scotland found that new respiratory illness represented 30 per cent of all new illness seen. Watson (1969) made the diagnosis of probable viral infection in 17 per cent of new episodes of illness.

Hurrell *et al.* (1971) took weekly cough swabs and faeces for viral culture from all members of two families during a period of almost two years. During this time the nine individuals studied experienced 136 upper respiratory tract infections accounting for over 80 per cent of the total experience of illness in the families.

Considering this vast amount of illness, albeit usually minor, there is a surprising dearth of surveys of its incidence in individual practices. Higgins *et al.* (1963 and 1964) made such studies of viral respiratory infections in a Wessex practice and a geriatric unit from a virologist's view point.

This is a survey of presumed viral respiratory infection detected in a single practice during 1971 viewed by a general practitioner.

The practice

There are 2,300 patients mainly living in and around two villages in the green belt to the East of Bristol and North of Bath. There is some local industry as well as agriculture but most of the working adults are employed in these two nearby towns. There is one primary and junior school for both villages and most of the secondary school children attend in the Bristol outskirts. The great majority of the community are patients of this practice.

Method

For several years the Director of the Public Health Laboratory at Bath has been able to provide a viral diagnostic service and recently he has organised regular monitoring of viral infections in and around the city. In addition, the County Medical Officer of Health for Gloucestershire has started a similar survey covering the whole county. The specimens from this practice still go to the Bath laboratory but the results are included in both the Bath and Gloucestershire surveys.

The aim was to collect specimens from the first six patients each week presenting within three days of onset of respiratory infections thought to be of viral origin. Those presenting with acute sore throat or otitis media as the main feature were excluded. In practice, suitable patients did not always present, sometimes opportunities were missed and during holidays it was not possible to continue the sampling.

In the majority of cases nose and throat swabs were taken, the patient being encouraged to cough on the latter. These were broken off into small bottles containing sterile milk and placed in a refrigerator as soon as convenient. During the last two months specimens collected in the patients' homes have been kept cool with a 'Freezella' pack in a polystyrene box pending transfer to the refrigerator. The specimens have been driven to the laboratory later on the same or following day.

In cases of suspected enteroviral infection, faecal samples have been collected instead and kept at room temperature. During the suspected Coxsackie B outbreak, an effort was made to collect specimens from all cases seen. Two swabs were taken from vesicles and one from an ear. Acute and convalescent blood samples were collected from a few patients. The symptoms and signs at presentation were tabulated.

Results

Isolation ratio

In all, 179 specimens were collected from 167 cases. The isolation rate is shown in table 1. In no case was more than one virus isolated from one patient in the same illness.

TABLE 1
VIRAL ISOLATION RATIO

Total number of patients	167 with	44 positive isolates	*26%*
Total number of specimens	179 „	45 „ „	*25%*
Nose and throat swabs	142 „	35 „ „	*25%*
Faeces	26 „	8 „ „	*31%*
Paired sera	8 „	2 „ „	*25%*

Seasonal distribution

The monthly isolations are shown in table 2, the viruses being listed in the order in which they first presented. *Herpes simplex* virus and *Poliomyelitis* virus are separated, the former because it is seemingly ubiquitous and recurrent in susceptible individuals, the latter because it was only found in a child whose sibling had recently received live poliomyelitis vaccine. The number of isolations, patients sampled and the proportion of positive results are also listed.

TABLE 2
SEASONAL DISTRIBUTION OF ISOLATES

	Jan	*Feb*	*Mar*	*Apl*	*May*	*June*	*July*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total*
Adenovirus 3	2												2
Rhinovirus M	1								1		1	1	4
Influenza B		1	4	2									7
Adenovirus 5		2											2
Adenovirus 2		1											1
R.S.V.		1											1
Coxsackie A16		1	1										2
Mycoplasma P.			1										1
Influenza A2			3			4						4	11
Coxsackie B5						3							3
Coxsackie B2						2							2
Rhinovirus H.											1		1
Parainfluenza 2												1	1
Herpes simplex	1							2	1		1		5
Poliomyelitis 1												1	1
Number of patients sampled	15	17	25	10	6	27	7	5	18	3	14	20	167
Number of isolations	4	6	9	2	0	9	0	2	2	0	3	7	44
Isolation rate %	*27*	*35*	*36*	*20*	*0*	*33*	*0*	*40*	*11*	*0*	*21*	*35*	*26*

There was some reduction in the isolation rate from the nose and throat swabs during the warmer months: during May–September eight positive cultures were obtained from 43 specimens, an isolation rate of 19 per cent, whereas there was an isolation rate of 26 per cent in the other months. The Coxsackie isolations were all from faeces. During this time no special precautions were taken to keep specimens cool while they were out of the refrigerator, the special cool transport box was not introduced until November when the weather was cool too.

Fifteen different virus types were isolated during the year and in some months several different viruses were found, with a peak of five in February.

Age distribution

(1) *Viruses other than Influenza A.* In table 3 the practice is analysed by its constituent age groups. Below this the viral isolations are listed in divided columns, the first for *Influenza A* and the second for all other viruses. The number of the latter is next given

TABLE 3

AGE DISTRIBUTION OF VIRAL ISOLATIONS AND SAMPLING 1971

Age	0–4	5–9	10–19	20–29	30–39	40–49	50–59	60–69	70+	*Total*
Patients at risk	180	220	320	327	348	292	258	211	136	2294
	A A			A A A	A	A A	A A	A		
	Pol*1* HS HS PI*2* RSV Cx*A16* Cx*A16* Cx*B2* Ad*2* Ad*5* Ad*5* B	Cx*B2* Cx*B5* Cx*B5* Rh*M* Ad*3* B B	H.S. Rh*M*	H.S. Cx*B5* Rh*H* B B	Rh*M* Ad*3* MyP B	H.S.	Rh*M* B			
Number of isolates other than A	12	7	2	5	4	1	2	0	0	33
Percent of population	*6·7*	*3·2*	*0·6*	*1·5*	*1·1*	*0·3*	*0·4*	—	—	*1·0*
Number of patients sampled	48	40	13	26	13	11	12	3	1	167
Percent of population	*27·0*	*18·2*	*4·0*	*8·0*	*3·7*	*3·8*	*4·6*	*1·4*	6 *0·7*	*7·3*

KEY

A	*Influenza A*	MyP	*Mycoplasma Pneumoniae*
B	*Influenza B*	PI	*Parainfluenza*
Ad	*Adenovirus*	Rh	*Rhinovirus*
Cx	*Coxsackie*	Pol	*Poliomyelitis*
HS	*Herpes simplex*	RSV	*Respiratory Syncytial Virus*

and is also expressed as a percentage of the population at risk. This isolation rate fell rapidly, being 6·7 per cent during the first five years, 3·2 per cent during the next and then decreased slowly to zero by the seventh decade.

Finally, the number of patients sampled is tabulated and also expressed as a percentage of the patients at risk. Specimens were taken from 27 per cent of the under five-year olds, 18·2 per cent of the 5–10 year-olds and thereafter from a slowly falling number at a considerably lower level. As the first six suitable patients seen each week were selected for swabbing, the percentage of the population sampled in the various age groups was related to the age distribution of the patients attending with acute respiratory infections. Most such infections seen were in children under ten, 88 of whom were sampled compared with 79 in the remaining 83 per cent of the practice.

(2) *Influenza A.* There were 11 isolations of *Influenza A* in March, June and December 1971 but there were a further 28 in January, February and March 1972. By adding the latter a more meaningful pattern of incidence could be demonstrated. These isolations are listed together in table 4 and again are accompanied by the isolation rate for each age group. The total of 39 cases represented a proven attack rate for the whole practice of 1·7 per cent. The lowest ratio for any age group was 0·9 per cent and the highest 3·3 per cent in the under five-year olds. There was thus no clear age related pattern. This distribution is in marked contrast to that found with the other viral isolations.

TABLE 4

AGE DISTRIBUTION OF INFLUENZA ISOLATIONS 1971–1972

Age	0–4	5–9	10–19	20–29	30–39	40–49	50–59	60–69	70+	*Total*
Number of positive isolates	6	2	3	8	3	4	7	3	3	39
Percentage of population	*3·3*	*0·9*	*0·9*	*2·4*	*0·9*	*1·4*	*2·7*	*1·4*	*2·2*	*1·7*

(3) *Total attendance rates in weeks with and without isolations of Influenza A.* During 1972, a record of the total number of cases of acute respiratory infection was recorded, this time including cases of otitis media and tonsillitis. During each of the first six weeks of the year *Influenza A* was isolated in the practice. During the next six weeks none was found. The attendances are set out in table 5.

TABLE 5

AGE DISTRIBUTION OF ALL NEW ACUTE RESPIRATORY TRACT INFECTIONS JANUARY–MARCH 1972

Age	0–4	5–9	10–19	20–29	30–39	40–49	50–59	60–69	70+	*Total*
Attendances in 6 influenza weeks	17	17	21	21	13	11	17	12	10	139
Percent of population	*9·4*	*7·5*	*6·4*	*6·4*	*3·7*	*3·8*	*6·6*	*5·7*	*7·4*	*6·1*
Attendances in 6 weeks without influenza A	42	30	17	8	12	10	2	8	5	134
Percent of population	*23·3*	*13·6*	*5·6*	*2·4*	*3·4*	*3·4*	*0·8*	*3·8*	*3·7*	*5·1*

In the Influenza A weeks the attendance rates again showed no clear pattern in age distribution, the highest being 9·4 per cent, the lowest 3·7 per cent with a mean of 6·1 per cent. In the non Influenza A weeks there was a reversion to the same 'shift to the left' pattern demonstrated above in table 3 with 23·3 per cent of the under five-year-olds attending, 13·6 per cent of the five to ten year-olds and 5·6 per cent of the next highest group. It is interesting that the attendance rate was little higher when *Influenza A* was prevalent than when it was not, this being due to the low attendance rate in the under ten-year-olds.

Clinical features

The presenting clinical features, were recorded on arithmetic paper at the time of presentation as in table 6. Those associated with the isolation of *Adenovirus*, *Rhinovirus*, *Influenza B* and *Herpes simplex* (with one exception) were all similar and those of non-specific colds. The two year-old child with herpes-simplex stomatitis was typical and suspected on examination.

The *Parainfluenza* and *Respiratory syncytial virus* isolates were both from children under one-year-old who were wheezing but not ill. Two of the 16 Coxsackie A16 children had typical lesions of hand, foot and mouth disease.

TABLE 6
CLINICAL FEATURES AT PRESENTATION

	Number of cases	*Ear*	*Nose*	*Throat*	*Cough*	*Chest signs*	*Eyes*	*Glands*	*Skin*	*Vomiting*	*Diarrhoea*	*Fever*	*Headache*	*General aches*	*Other*
Adenovirus	5	2	2	3	3				1			2		2	
Rhinovirus	5		4	3	4			1				2	1		
Influenza B	7	1	3	3	5		1	1	1	1		2	2	2	
Herpes simplex	5		1	3	2							2		3	1 Giddiness 1 Stomatitis
Parainfluenza	1				1	1									Wheeze
Respiratory S.V.	1	1	1			1									Wheeze
Coxsackie A16	2		1	1					2	1					2 Hand, foot and mouth disease
Coxsackie B	5		1				1		5	1					
Mycoplasma pneum.	1				1	1						1		1	
Influenza A	11	2	1	3	10	1						9	4	7	

The *Coxsackie B* isolations numbered only five, three being type B5 and two type B2. Faecal specimens were taken from 19 out of a total of 23 cases seen, each of whom had the lesions of what came to be known as the 'Wick itch'.

The first case was seen on 13 May and the last on 6 September 1971. There was a characteristic rash consisting of a single group of fine papules. Cases ranged from those with lesions closely aggregated so as to be almost confluent forming a sharp-edged patch, to others with a group of a few fine papules only; these were found on the trunk, neck or upper ends of the limbs. The rash was irritating and sometimes persisted for a week or two. Most cases were not febrile; some had vomiting or a cold. It is known that Coxsackie viruses can be carried for long periods in the gut and such infections are common in the summer. It will therefore require other corroborative observations to prove that this is a Coxsackie B exanthem.

The patient thought to have an infection due to *Mycoplasma pneumoniae* did not

attend until she had been ill for a week. Her first titre of 1/320 only rose to 1/640 after a fortnight.

Those with *Influenza A* were almost all ill, usually with the classic symptoms.

Discussion

During the year, 15 different viruses were isolated but no doubt there were more undiscovered among the patients seen. In one month five, in another four and each of three months, three different viruses were isolated. To prove that these small or single isolations were tokens of a community prevalence would require a continuous viral survey of a carefully selected sample of the population. Such proof is manifestly beyond the scope of this small survey of clinical acute respiratory infection selected for presentation to the doctor by the patients themselves or their parents.

However, there are indirect reasons which can be adduced in favour of this hypothesis being valid:

(a) For every patient seen with a respiratory infection it can be assumed there were others who did not present, either because their symptoms were mild or they did not wish to bother the doctor with complaints he could not cure. These attitudes are actively encouraged and the habitual questioning of patients for their likely source of infection frequently brings to light others who have not been seen at all. The consultation rate in this practice is low (3,105/1,000 patients at risk during 1971) and it is likely that the number of attendances with respiratory infections is at least correspondingly low.

(b) For every positive culture there were three negative ones. Some of these may have been due to bacterial infections wrongly thought to be viral but the rest were due to imperfections in the collection, transport or culture of specimens.

(c) Since viruses do not remain for long periods in the naso-pharynx, each patient with a positive culture from this site must have acquired the agent recently from another carrier; he is likely in his turn to have transmitted it to others in his circle of contacts. Those before and after him in the chain of transmission will have experienced either a similar clinical infection, an unwitting subclinical one or a transient carrier state.

(d) As the practice area encompasses all the residences and a sizeable proportion of the employment, shopping and schooling of the community, it can be assumed that most of the patients referred to in this paper will disseminate their viruses in the practice community and many will have acquired them within it.

In general practice a common experience is to have a child brought up repeatedly over the course of a few weeks by an increasingly worried mother. No sooner does he begin to recover from one cold than another begins and, not unnaturally, the mother begins to suspect some more sinister pathology causing a prolonged and fluctuating illness, but fortunately time proves her fears groundless. Should there be a prevalence of several viruses in the practice at the same time this would provide a simple explanation.

Every general practitioner knows that most sick children whom he attends have acute respiratory infections and most such infections seen are seen in children. All older parents know that their children grew out of their frequent colds, coughs, ear aches and sore throats by the time they were in their teens. The age distribution section of this paper is largely a demonstration of the truth of these truisms. The ' shift to the left ' pattern in age of attendances is shown to correlate with a similar pattern of viral isolations when *Influenza A* is not present in the community.

This contrasts sharply with the undifferentiated age pattern of isolations of *Influenza A* and also of the attendances during the weeks when it was current in 1972. One of the interesting unresolved questions about this infection is its where-abouts between outbreaks once it has reached us from abroad; for instance it was isolated in this

practice in March, June and December. Perhaps on noting a week in which attendances for acute respiratory infection have shown a ' shift to the right ' a serological survey of the adult attenders might prove fruitful.

Summary

A viral survey is reported of patients presenting with acute respiratory infections in a general practice during 1971. The results are given in their seasonal and age distributions. Both the viral isolations (other than *Influenza A*) and proportion of attenders was much higher in the first five years, falling rapidly by the age of ten and thereafter through life. The isolation of *Influenza A* by contrast was unrelated to age as also was the attendance rate during the weeks when this infection was prevalent in early 1972. The clinical features at presentation are given including a description of a rash possibly caused by Coxsackie B.

Acknowledgements

The virology of which this paper is a record was carried out in the Public Health Laboratory, Bath. I am very grateful to Dr P. G. Mann, the Director, and all the staff of the laboratory for their skills and unfailing help in this as in all matters.

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BACTERIAL COUNTS IN URINES

A study was carried out in general practice to assess the significance of bacterial counts between 20,000 and 99,000 bacteria per ml in mid-stream specimens of urine.

From 394 females, 1,047 mid-stream specimens were cultured, 55 of which were found to have pure bacterial growth within this range. Of these 55 patients, 40 per cent either had clinical evidence of urinary tract infection at the time of culture or developed it later.

From these results it is suggested that such bacterial counts are highly significant and should not be disregarded.

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