

Acute Respiratory Disease in the United States Army in the Republic of Vietnam, 1965-1970

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Respiratory tract infections represented one of the commonest illnesses that occurred among U.S. Army personnel stationed in the Republic of Vietnam. Between 1965 and 1970, the years of this review, respiratory tract infections ranked approximately equal to diarrheal disease as a cause of hospitalization or assignment to quarters. Rates varied between 20 and 110 per 1000 troops per year. The specific causal agents responsible for acute respiratory diseases in Vietnam were not defined. Limited observations suggest that members of the adenovirus group and respiratory syncytial viruses were involved. During the fall of 1968, influenza due to the A2 Hong Kong strain (H3N2) was widespread, but it was not associated with marked increases in rates of hospitalization or mortality. *Mycoplasma pneumoniae* was the most common demonstrable causative agent in soldiers admitted to hospitals with pneumonia, 42% in one series.

Acute infections of the respiratory tract constitute a major health problem not only for civilians and the military recruit, but also remain a major problem for seasoned military troops, even when such troops are assigned into areas of the world where hygienic and climatic conditions predispose to other illnesses such as gastrointestinal disorders and a variety of skin diseases. Such was the experience of the United States Army Vietnam, where rates for respiratory infections (including soldiers reporting on sick call, as well as individuals placed on quarters and admitted to medical care facilities) varied between 315 and 617 cases per 1000 troop strength per annum for active duty military personnel (1). In the past 20 yr, virologists have made major advances in defining the etiologic agents causing common respiratory diseases. More than 100 agents are now recognized which can cause respiratory disease in humans (2). This presentation aims to summarize observations on acute respiratory illnesses in U.S. Army personnel who were assigned to the Republic of Vietnam, and to present recommendations for future information which would seem useful in better defining unanswered problems and in developing methods for control.

METHODS

Most of the data have been obtained from Command Health Reports, Report Control Symbol RCS MED-3 (R3). The monthly USARV Command Health Reports as well as those from selected units (1st Air Cavalry Division, 173rd Airborne Brigade [Separate] and 9th Infantry Division) have been reviewed not only for rates but for the comments of the preventive medicine officers. In these reports, rates are defined as follows:

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rate = (new cases × 1000 × days in year)/(average morbidity strength × days in month)

The terminology utilized is as follows:

ARD: acute respiratory disease; cases requiring hospitalization or assignment to quarters

CRD: common respiratory disease; used interchangeably with ARD

URI: upper respiratory infection; includes all individuals seen on sick call (out-patients) with symptoms of upper respiratory infection as well as those individuals requiring hospitalization and assigned to quarters except for patients diagnosed as having pneumonia, influenza, and streptococcal sore throat

Pneumonia: a separate category. Specific requirements for radiographic changes are not defined.

Unfortunately, laboratory support to identify respiratory disease agents was limited essentially to the detection of cold hemagglutinins. The 9th Medical Laboratory Activities Report for 1968 states, "projected plans call for a greater inclusion of known agents of respiratory disease. Isolation attempts will also be conducted to determine antigenic variants of the principal groups being studied" (3).

OBSERVATIONS

The rates for URI show marked variation between different units; for example, in March 1969 the rate was reported as 2.2/1000/yr in the 1st Infantry Division, while that reported from the 11th Armored Cavalry Regiment was 167/1000/yr. These differences almost certainly reflect differences in reporting. Overall URI rates appear to fall in the range of 350–600/1000/yr for 1968–1970, which is remarkably close to the lowest rate from Fort Bragg in June–July 1944 (520/1000/yr) (4).

The ARD rates show less variation, and may reflect more accurately the total respiratory disease problem, although only 6.5–12% of all individuals with respiratory diseases are assigned to quarters or admitted to hospitals. Rates for the U.S. Army Vietnam for 1965–1970 are plotted in Fig. 1. These rates (20–110/1000/yr) are comparable with the rates observed for the Army in the continental United States during 1944–1945 (50–200/1000/yr), especially since these latter rates included a proportion of recruits. The reason for the higher rates in 1965 is not apparent.

A role of weather changes in the frequency of URIs (and possibly ARD) was sug-

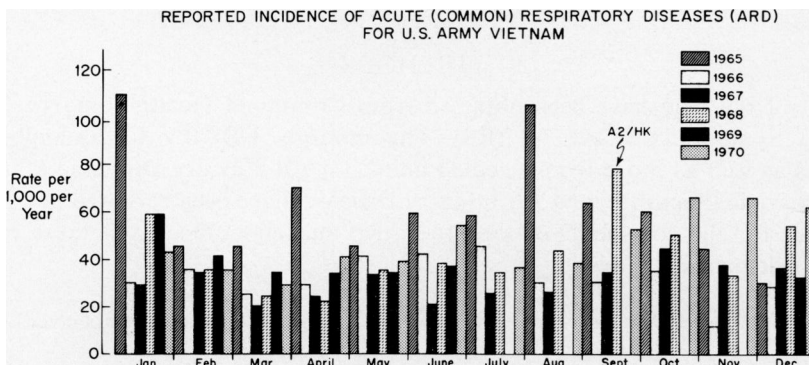


FIG. 1.

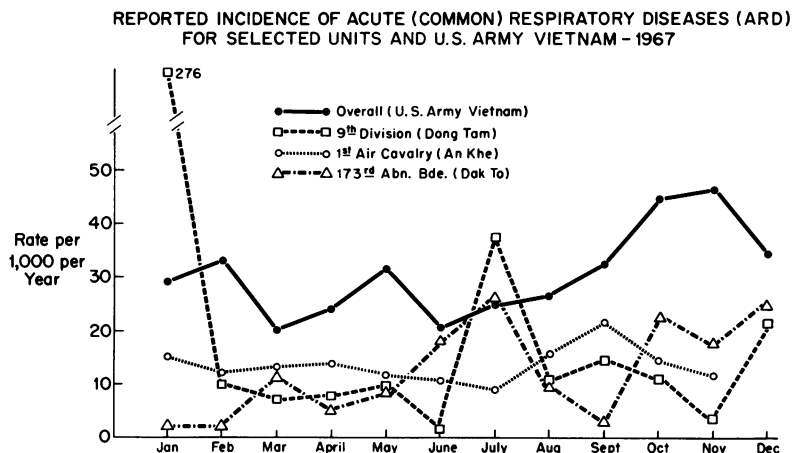


FIG. 2.

gested by comments made in the health reports from various units. An increase in URIs between December 1968 and January 1969 in XXIV Corps Area (I Corps) was associated with the occurrence of cooler weather, especially at night, and rain. Likewise, in April 1969 an increase in URIs at Long Binh was associated with the monsoon. In an attempt to better document these impressions, ARD rates for 1967 for the 9th Infantry Division at Dong Tam (IV Corps in the Mekong delta) were compared with the rates for the 1st Air Cavalry Division at An Khe and the 173rd Airborne Brigade at Dak To, both in II Corps in the Central Highlands (Fig. 2). The 9th Infantry Division would have been subject to the summer monsoons and temperatures which often exceed 100° F in midday, while the 1st Air Cavalry Division and 173rd Airborne Brigade would have been in the area of the winter monsoons (October–April) and temperatures in the 70s. No correlation can be made between dry season, monsoon season and differences in temperature associated with differences in altitude and ARD rates.

Rates for the occurrence of pneumonia were 8–10% of the ARD rates, varying between 1.3–6.8/1000/yr (except for a rate of 10.5/1000/yr in November 1967).

Confirmation of the specific etiologies which were responsible for ARD has not been possible. In the late summer and fall of 1968, the occurrence of influenza A2 (Hong Kong) (H3 N2) is apparent from individual reports. In August classical symptoms of an influenzal syndrome were noted in various units such as the 11th Armored Cavalry Regiment (ACR) near Xuan Loc. In the 11th ACR, rates for ARD increased from 98.8/1000 in July to 386.1/1000 in August. In December 1968, an increase in influenzal illness was reported from the Americal Division. These observations coincide with those reported by Smith and associates with Korat Royal Thai Air Force Base, Thailand, where the initial peak of Hong Kong influenza occurred during the week of 19 August 1968 and the outbreak lasted through October (5). In this latter experience, the duration of illness varied between 1 and 14 days (average 3.8 days), with an average of 2.6 days having been lost from duty. The attack rate was 8% based upon number of individuals off duty and 12.2% based upon a serological survey. The spread was slow, with no more than 1.5% of troops indisposed at any one time; thus, the outbreak was only slightly disruptive of activities. Also, the outbreak subsided at a time when a large segment of the population remained susceptible. The relatively minor increase in ARD reported during the fall

TABLE 1
Role of Acute Respiratory Agents in Episodes of Acute Febrile Illness Occurring in Special Forces Troops on Six Months Tour in Republic of Viet Nam, 1963

Total number of persons in study	553
Number with one or more episodes of acute febrile illness	97
Number with one or more positive serologic rises	49
Number of serologic rises to specific respiratory antigens ^a	
Adenovirus group	20
Influenza A	6
Influenza B	3
Respiratory syncytial virus	9
Q fever	3

^aFourfold or greater rise in titer.

of 1968 (Fig. 1) may be the result of these same epidemiologic features in Vietnam, especially since the A2/Hong Kong influenza vaccine was not received until late in 1968 or early 1969.

In a study of the etiology of fevers of unknown origin in Special Forces personnel in 1963, Letgers, Buescher, and Coppage (6) observed that serologic evidences of infection with a respiratory agent were the most common probable etiology (Table 1). These observations are of particular interest in view of the relative proportion of adenovirus group infections. In a study of adenoviruses isolated from conjunctival specimens in eastern Saudi Arabia, adenovirus types 1, 2 and 5, which are common in the United States, were never isolated, while types 15, 16, 17, and several new types which were common in Arabia have not yet been reported in the United States (7). One can only speculate that despite these men being seasoned troops, they encountered adenovirus types with which they had not had previous contact. In view of the differences in adenovirus types encountered in civilians and the military in the United States and military groups elsewhere in the world, this seems highly possible. The occurrence of respiratory syncytial (RS) virus is also of considerable interest since almost all adults have antibody. Respiratory syncytial virus has been involved primarily in causing respiratory disease in infants and children, although a common cold-like syndrome can be produced in adult volunteers and acute lower respiratory illness has been observed in elderly patients (8-11).

A study by Arnold (12) provides additional insight into the etiology of pneumonia in a group of hospitalized patients. Consecutive patients (68 individuals) admitted to the U.S. Army 3rd Field Hospital in Saigon with a diagnosis of pneumonia between November 1969 and February 1970 were studied utilizing bacteriological and virological isolation techniques (monkey kidney cells and WI-38 human diploid cells) and serological procedures (cold agglutinins, psittacosis, *Mycoplasma pneumoniae*, respiratory syncytial, adenovirus group, influenza A, influenza B, parainfluenza 1 and 3, as well as melioidosis). Of the 68 patients, 59 were U.S. military personnel stationed within 50 miles of Saigon. Acute and convalescent serum specimens were obtained from 58 of the patients. In these 58 patients, 24 (42%) had significant increases in the complement fixation test for *M. pneumoniae* (cold agglutinins were elevated in eight patients, six of whom had a positive complement fixation test for *M. pneumoniae*). Analysis of the clinical features failed to reveal differences which would have allowed the patients with *M. pneumoniae* infections to be distinguished from the others. Among infectious diseases diagnosed in 1969 in

TABLE 2
Positive Cold Agglutinin Titers Reported by the 9th Medical Laboratory, Republic of Vietnam, 1969^a

Treatment facility	Location	Cold agglutinin positive pneumonia (no. of cases)
3rd Field Hospital	Saigon	5
6th Convalescent Center	Cam Ranh	2
24th Evacuation Hospital	Long Binh	5
3rd Surgical Hospital	Dong Tam	3
67th Evacuation Hospital	Qui Nhon	1
91st Evacuation Hospital	Tuy Hoa	2
93rd Evacuation Hospital	Long Binh	2
95th Evacuation Hospital	Da Nang	1
Miscellaneous sources		2
		23

^aData incomplete for November and December.

consultation with the 9th Medical Laboratory, there were 23 cases of primary atypical pneumonia (Table 2) (13). These diagnoses are based upon positive cold agglutinins, hence grossly underestimate the actual occurrence of *M. pneumoniae* infections, but do indicate that cases were encountered throughout Vietnam. These observations are essentially comparable with those seen in the United States, where *M. pneumoniae* is responsible for 20–44% of hospitalizations with pneumonia (14–16).

CONCLUSIONS

1. Respiratory tract infections represented one of the major illnesses among U.S. Army personnel ranking approximately equal to diarrheal disease as a cause of hospitalization or assignment to quarters.

2. The specific causal agents responsible for the acute respiratory disease syndrome in Vietnam were not defined. Limited observations suggest the occurrence of members of the adenovirus group and respiratory syncytial viruses. During the fall of 1968, influenza due to the A2 Hong Kong strain (H3 N2) was widespread, but it was not associated with marked increases in rates of hospitalization or mortality.

3. *Mycoplasma pneumoniae* was the most common demonstrable causative agent in soldiers admitted to hospitals with pneumonia, 42% in one series.

RECOMMENDATIONS FOR FUTURE CONSIDERATION:

1. Standardized diagnostic and reporting criteria should be developed and utilized to enable more meaningful surveillance.

2. Because of the prevalence of acute respiratory disease even among seasoned troops and the potential for developing means of immuno- and/or chemoprophylaxis, appropriate clinical and laboratory support should be provided early to enable definition of the problems.

3. Data should be collected which will enable determination of the cost of specific disease entities in terms of time lost from duty and interference with unit mission effectiveness. Such data will enable a rational establishment of priorities in committing resources to the development of control measures.

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