Viral Hepatitis in the Air Force

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The reported incidence of viral hepatitis in the Air Force has increased over the past 10 years. The total number of days lost from duty has declined as has the average number of days lost per case. Distribution of USAF reported cases has been roughly equally divided among the three diagnostic categories, in contrast to the total United States reported distribution. Relatively few USAF cases have had a documented history of drug abuse since we began collecting this information, and the proportion of these cases has steadily declined. Finally, these diseases still represent significant economic and operational costs to the Air Force so that prevention and control remain important items of concern to commanders and the medical service.

The Air Force Medical Service has been compiling rather extensive data on viral hepatitis for some time. These data all reflect our experience with USAF active duty and dependent patients admitted to USAF medical facilities and are based on discharge diagnoses. No reliable outpatient data are available. However, we can reasonably assume that almost all active duty cases have been admitted either to a facility or to quarters, both of which are included in our inpatient data base.

Prior to 1974 the coding system did not distinguish between types: the designation Type B was made only when a case was directly related to postimmunization, to post-transfusion, or to some complicating therapy. All cases not fitting this definition were coded as "infectious hepatitis."

General Incidence

Table 1 shows the numbers of cases and incidence per 100,000 strength in the Air Force since 1965. These data are from tables which are based on preliminary reports representing 80-90% of the total information on file. Therefore, they should represent accurate trends of the information even if absolute numbers are not complete. It can be seen that both the numbers of cases and the incidence of hepatitis have more than doubled in the decade. These trends are graphically depicted in Figs. 1 and 2.

Table 2 summarizes the USAF Medical Facility experience with dependents of USAF active duty in terms of number of cases, average length of hospital stay, and total hospital days by year since 1965. No rates are calculated on this group due to lack of an accurate denominator. We can see, however, that all parameters are decreasing, including the average length of hospitalization. As we will see later, a similar trend in length of illness is evident among active duty cases.

Geographic Distribution

The geographic distribution of hepatitis is shown in Table 3 which depicts the geographic breakdown of the experience since 1969. The numbers of cases are shown in Part I and the incidence rates in Part II. The rise in incidence worldwide reflected rises in most parts of the world where there were sufficient numbers of personnel stationed to give meaningful rates. Obviously, the rates from Viet Nam for 1973 and 1974 are based on too few cases and too small a denominator to be meaningful.
TABLE 1
Number of Cases and Incidence of Viral Hepatitis in USAF Active Duty Personnel, Worldwide, 1965–1974

| Year | Number of cases | Cases/100,000 strength |
|------|----------------|------------------------|
| 1965 | 574            | 69.3                   |
| 1966 | 694            | 79.2                   |
| 1967 | 980            | 109.6                  |
| 1968 | 979            | 110.9                  |
| 1969 | 957            | 111.3                  |
| 1970 | 947            | 120.3                  |
| 1971 | 1020           | 135.7                  |
| 1972 | 989            | 135.9                  |
| 1973 | 1059           | 154.4                  |
| 1974 | 1125           | 174.6                  |

FIG. 1. Number of diagnoses of all viral hepatitis cases among USAF personnel on active duty, 1965–1974.

FIG. 2. Incidence, cases/100,000 strength, of viral hepatitis among USAF personnel on active duty, 1965–1974.
Where data were adequate, increases in incidence rates from 1969 to 1974 were 1.5-fold in the continental United States (CONUS), 1.6 in the Far East, and 1.26 in Thailand. The Far East has certainly been our main high risk area in terms of significant numbers of personnel assigned, with only Japan exhibiting rates comparable or lower than those of the CONUS. This is not surprising in view of the level of sanitation in many of the Far Eastern areas.

Incidence by Type

In January 1974, the three Armed Services changed the system for coding viral hepatitis so that data could be collected by type, if known. At the same time, new codes were introduced to determine whether cases of hepatitis might be associated with a history of drug abuse. Table 4 shows USAF experience from January 1974 through June 1975. These are cases in USAF active duty personnel and are again based on discharge diagnoses. These data are more complete than those in Table 1, so that the total number of cases for 1974 here (1370) is greater than in Table 1 (1125). The relative frequency of each diagnostic category has remained roughly constant on a percentage basis for each time period. Table 5 summarizes Table 4 and indicates that each of the three basic diagnostic categories, i.e., A, B, and “not otherwise specified” (NOS) represents approximately one-third of the total. The actual figures for the 18-month period are 35.6% for Type A, 27.6% for Type B, and 36.8% for the NOS category. This is in contrast to the percent distribution reported for the civilian United States by the Center for Disease Control for 1974 (1) which reported 68% for Type A, 18% for Type B, and 14% in the unspecified category.

Relation to Drug Abuse

The relation of hepatitis to drug abuse is shown in Table 6. Less than 10% of our military cases of viral hepatitis from January 1974 through June 1975 had had a history of documented drug abuse. Additionally, there has been a small decline in the percentage of cases with such a history over the 18-month period. This decline is seen in both the opiate and nonopiate categories.

Costs of Hepatitis to the Air Force

Estimates of the cost of viral hepatitis to the Air Force are depicted in Table 7. In the 10-year period from 1965–1974, there have been a total of 9324 active duty cases
## TABLE 3
Number of Diagnoses and Incidence Rates of Viral Hepatitis B1, Geographic Origin, USAF Active Duty Personnel, 1969–1974

| Year | Worldwide | CONUS | Puerto Rico | Northern Europe | Southern Europe, North Africa, and Azores | Arabian Peninsula and India | Far East | Japan | Korea | Okinawa | Philippine Islands | Taiwan | Thailand | Vietnam |
|------|-----------|-------|-------------|----------------|------------------------------------------|-------------------------------|---------|-------|-------|--------|-------------------|--------|----------|---------|
|      |           |       |             |                |                                          |                               |         |       |       |        |                   |        |          |         |
| I.   | Number of cases |       |             |                |                                          |                               |         |       |       |        |                   |        |          |         |
| 1969 | 957       | 335   | 2           | 23             | 61                                        | 22                            | 497     | 18    | 32    | 3      | 86                | 37     | 176      | 145     |
| 1970 | 945       | 383   | 3           | 24             | 29                                        | 17                            | 457     | 21    | 17    | 5      | 48                | 64     | 154      | 148     |
| 1971 | 1020      | 496   | 0           | 28             | 16                                        | 17                            | 429     | 18    | 29    | 3      | 47                | 40     | 156      | 136     |
| 1972 | 989       | 514   | 0           | 19             | 52                                        | 9                             | 358     | 12    | 53    | 9      | 36                | 33     | 165      | 50      |
| 1973 | 1059      | 607   | 2           | 7              | 15                                        | 20                            | 327     | 14    | 64    | 28     | 15                | 29     | 171      | 6       |
| 1974 | 1125<sup>b</sup> | 538   | 0           | 4              | 24                                        | 18                            | 303     | 2     | 47    | 47     | 18                | 28     | 160      | 1       |
| II.  | Cases/100,000 |       |             |                |                                          |                               |         |       |       |        |                   |        |          |         |
| 1969 | 111       | 59    | 29<sup>a</sup> | 41             | 367                                       | 238                           | 308     | 92    | 359   | 19<sup>a</sup> | 491                | 508    | 514      | 249     |
| 1970 | 120       | 72    | 45<sup>a</sup> | 44             | 216                                       | 277                           | 319     | 112   | 210   | 34<sup>a</sup> | 327                | 902    | 507      | 300     |
| 1971 | 136       | 94    | 0           | 55             | 134                                       | 293                           | 366     | 123   | 320   | 26<sup>a</sup> | 405                | 585    | 586      | 364     |
| 1972 | 136       | 96    | 0           | 36             | 392                                       | 158                           | 388     | 112   | 601   | 82     | 359                | 480    | 581      | 315     |
| 1973 | 154       | 118   | 48<sup>a</sup> | 13             | 115                                       | 425                           | 161     | 821   | 320   | 169    | 414                | 492    | 2789     |         |
| 1974 | 173<sup>b</sup> | 115   | 0           | 7<sup>a</sup>  | 186                                       | 356                           | 495     | 30<sup>a</sup> | 649 | 552 | 178 | 731 | 649 | 3087<sup>a</sup> |

<sup>a</sup> Based on five or fewer cases.

<sup>b</sup> The worldwide figures for 1974 include 105 cases which are not included in the remainder of the geographic breakout.
### TABLE 4
Number and Percentage of Diagnoses of Viral Hepatitis by Diagnostic Category
Using New Coding System, January 1974–June 1975

| Diagnosis                                | January–June 1974 | July–December 1974 | January–June 1975 |
|------------------------------------------|-------------------|--------------------|-------------------|
|                                          | Number | Percent | Number | Percent | Number | Percent |
| Viral hepatitis A, HBA negative         | 225     | 33      | 190    | 28      | 165    | 28      |
| Viral hepatitis A, HBA not performed    | 40      | 6       | 29     | 4       | 50     | 8       |
| Viral hepatitis B, HBA positive         | 127     | 18      | 146    | 22      | 129    | 22      |
| Viral hepatitis B, HBA negative         | 39      | 6       | 44     | 6       | 22     | 4       |
| Viral hepatitis B, HBA not performed    | 16      | 2       | 11     | 2       | 8      | 1       |
| Viral hepatitis, NOS                    | 244     | 35      | 259    | 38      | 218    | 37      |
| Total                                   | 691     | 100     | 679    | 100     | 592    | 100     |

### TABLE 5
Summary of Viral Hepatitis Diagnoses and Percentage of Total by Diagnostic Category, January 1974–June 1975

| Diagnosis              | January–June 1974 | July–December 1974 | January–June 1975 |
|------------------------|-------------------|--------------------|-------------------|
|                        | Number | Percent | Number | Percent | Number | Percent |
| Viral hepatitis A       | 265    | 38.4    | 219    | 32.3    | 215    | 36.5    |
| Viral hepatitis B       | 182    | 26.3    | 201    | 29.6    | 159    | 26.9    |
| Viral hepatitis NOS     | 244    | 35.3    | 259    | 38.1    | 218    | 36.8    |
| Total                  | 691    | 100     | 679    | 100     | 592    | 100     |

### TABLE 6
Relation of Viral Hepatitis and History of Drug Abuse, USAF Medical Facilities, Worldwide, January 1974–June 1975

| Drug abuse history    | January–June 1974 | July–December 1974 | January–June 1975 |
|-----------------------|-------------------|--------------------|-------------------|
|                       | Number | Percent | Number | Percent | Number | Percent |
| Opiate abuse          | 21     | 3.03    | 15     | 2.20    | 9     | 1.54    |
| Other drug abuse      | 39     | 5.62    | 34     | 4.98    | 18    | 3.07    |
| No drug abuse         | 634    | 91.35   | 634    | 92.82   | 559   | 95.39   |
| Total                 | 694    | 100     | 683    | 100     | 586   | 100     |

### TABLE 7
Days Lost from Duty by USAF Active Duty Personnel Due to Viral Hepatitis, 1965–1974

| Year  | Number of cases | Total days lost | Average days lost/case |
|-------|-----------------|-----------------|------------------------|
| 1965  | 574             | 20,388          | 35.5                   |
| 1966  | 694             | 26,501          | 38.2                   |
| 1967  | 980             | 33,987          | 34.7                   |
| 1968  | 979             | 36,362          | 37.1                   |
| 1969  | 957             | 34,068          | 35.6                   |
| 1970  | 947             | 26,140          | 21.6                   |
| 1971  | 1020            | 22,561          | 22.1                   |
| 1972  | 989             | 20,656          | 20.9                   |
| 1973  | 1059            | 20,274          | 19.1                   |
| 1974  | 1125            | 18,146          | 16.1                   |
| Total | 9324            | 259,081         | 28.1                   |

Total man years lost (10 yr) 709.8
Total man years lost per year 71
Average salary cost per year using present E-1 base pay $307,836.12
Total man years lost in 1974 49.7
Salary cost in 1974 using present E-1 base pay $215,485.28

209
recorded. The total days lost from duty have been 259,081 and have averaged 28.1 days/case. This computes out to 709.8 man-years lost for the 10-year period, or an average of 71 man-years/year. In terms based on the present basic pay of the lowest enlisted grade ($4335.72), this represents a dollar loss of $307,836.12/year. However, this figure involves loss of personnel salary only and makes no provision for the costs of medical care, the replacement of personnel, epidemiologic investigations, γ-globulin prophylaxis of contacts, and numerous other factors which are actually involved in the total cost of this disease. There are also the costs of caring for dependent cases. Most military cases do not occur in personnel of the lowest enlisted grade so that actual basic salaries of most of these patients are considerably higher.

In 1974 alone, there was a loss of 49.7 man-years due to viral hepatitis. Using the same salary figure, this comes out to a $215,485.28 loss in basic pay dollars. The cost for an inpatient day in a USAF medical facility was $110.49 in fiscal year 1975. Therefore, the 933 days of dependent hospitalization in 1974 (Table 2) was worth about $103,000. These two items alone add up to slightly over $318,000. It is interesting to note in this table that the average number of days lost from duty per case has steadily declined. However, these diseases still represent a large expense to the Air Force.

REFERENCE

1. U.S. Public Health Service, Morbidity and Mortality Weekly Report 23 (53), 24–26 (15 July, 1975).