15 years of age. The 'other blood dyscrasias' category was two-thirds male with no persons under 35 years. The 'undiagnosed' category was characterized chiefly by persons of advanced age.

Family history

Occurrence of a family history of blood dyscrasias in the study sample was of interest because of recent knowledge of drug-induced blood disorders related to a genetic deficiency of an enzyme in the red blood cells. Most hospital records contained no reference to blood dyscrasias in the family. Only nine indicated familial occurrence of such a blood disorder. Because of the few recorded familial cases and the variety and vagueness of the disorders described in other members of the families, it is impossible to relate family history findings to the study sample.

Related diseases

Certain disease conditions may have been related to the development of blood dyscrasias in the study sample. Viral diseases are thought to be capable of precipitating aplastic anemia in the weeks immediately following the acute episode. Collagen diseases may involve bone marrow as part of a systematic process. Impairment of liver or kidney function may interfere with detoxification and excetion of drugs or chemicals. These conditions occurred in the study sample, their frequencies varying with the diagnostic category. Prior to onset of symptoms of blood dyscrasias, viral infections as well as other infections occurred predominantly in the 'aplastic anemia' category. Nineteen out of a total of 24 persons with viral infections and 21 out of a total of 28 with other infections were in the 'aplastic anemia' category. Five of a total of six persons with collagen disease were in the 'aplastic anemia' category. Thirteen persons with renal disorders and a large number of persons with miscellaneous medical conditions were distributed throughout the three categories.

Viral infections less than one month before the onset of the blood dyscrasias were recorded for 10 persons, all in the 'aplastic anemia' category. All were children under 15 years of age except one person aged 21 years. Four had had rubeola, two of whom also had had frequent upper respiratory infections; the other six had had respiratory infections. Four, including the two with rubeola, had been treated with chloramphenicol, three with other antimicrobials but no record of chloramphenicol, and one with another drug not known to be toxic to blood. Blood counts before the onset of blood dyscrasias were available for only two of the ten persons. In one the blood was described as normal 5 days before the onset of bleeding. In the other there were peripheral blood changes consistent with viral infection. The above observations permit no conclusions as to the influence of viral disease on the subsequent development of aplastic anemia since many of these cases might have received chloramphenicol for the viral infection.

Exposure to toxic agents

Exposure was defined as contact with a drug or chemical agent by ingestion, injection, inhalation, or skin or mucous membrane contact in the 6 months preceding clinical onset of blood dyscrasia. It also included therapeutic application of ionizing radiation and, in the case of radioactive isotopes, diagnostic or therapeutic application at any time during the person's life. Data on diagnostic X-rays were omitted, not because they were considered insignificant but because the medical records did not provide this information.

The exposure data for the study sample of 138 deaths are summarized in Table 3. Eighty-eight persons were reported to have had exposure to a total of 118 different drugs plus a number of incompletely identified drugs, other chemical agents and radiation. Forty-six persons—one-third of the study sample—were exposed to agents known to be toxic to blood. Chloramphenicol accounted for the exposures of 30 persons, while 11 other agents accounted for exposures of the remaining 16. These 12 agents (listed on p. 908) are commonly or potentially toxic for blood cells and are designated as agents known to be toxic for blood in the remainder of this paper.