

Forty-nine propoxyphene victims were certified in 1975. This increase may be due largely to enhanced suspicion, search efforts, and new techniques. The unsupervised lay coroners who preceded the development of our Medical Examiner System had little knowledge or stimulus to obtain tests for propoxyphene or other drugs. There was no system providing a knowledgeable person to counsel the investigations or laboratory support when drugs were suspected.

At present, the county medical examiners in North Carolina are guided to consider each death investigated as possibly drug related. Furthermore, each case is reviewed at the OCME by the Chief Toxicologist and a forensic pathologist who can order additional toxicologic studies.

The techniques for detection of propoxyphene have been refined during the past five years. An inadequate spectrophotometric method was improved in 1972⁸ and further improved in 1974.⁹ Gas chromatography is now our analytical method of preference because it allows detection of blood propoxyphene and its active metabolite norpropoxyphene.¹⁰ The former method detects propoxyphene but only part of the norpropoxyphene. Techniques that are inferior in sensitivity and specificity to both methods are still being used in many laboratories. A recent national survey¹¹ of toxicologic laboratories reported 50 to 138 responding toxicology laboratories did not test for propoxyphene; nine indicated a negative result on the proficiency test samples; 24 reported detection but no quantitation. Of the 54 attempting quantitation, only 16 were within 30% of the correct concentration; of these 16, only five, including ours, were within 10%.

We believe the improvements in the local medical examiner investigation and in techniques for detecting propoxyphene were primarily responsible for the increase in propoxyphene deaths from four in 1971 to 22 in 1972. The jump from 28 cases in 1974 to 49 in 1975 is alarming since the system and techniques did not change drastically. Our toxicologic data indicate the rise is associated with a shift in popularity of drugs. Barbiturates had been identified in more drug deaths than any other agent until 1975. In that year deaths from barbiturates decreased while propoxyphene fatalities increased and other miscellaneous and fatal drug deaths showed no significant change. We offer no adequate explanation for the marked shift.

(3) *Experience in Other Parts of the Nation.* In 1973 Sturner and Garriott⁷ reported from Dallas 49 deaths involving propoxyphene among which ten were due to propoxyphene alone, 12 to propoxyphene and ethanol, and two to propoxyphene with other drugs. In 1973 the Drug Control Division of the Bureau of Narcotics and Dangerous Drugs (BNDD) reported propoxyphene data including death cases from 34 states during the years 1971 and 1972.² Propoxyphene was judged solely responsible for 230 deaths and contributing in 27 others in the BNDD study. Our contacts with other medical examiner systems and coroner offices indicate distinct increases. A recent national survey¹² has uncovered over 1,000 propoxyphene deaths

between 1972 and 1974 in selected medical examiner systems and coroner offices. These data suggest propoxyphene deaths are not a local or regional phenomenon.

(4) *Characteristics of the Population Affected.* Propoxyphene deaths occur at all ages. In our study the fifth decade accounted for 30% of the 100 deaths with the average age of approximately 40 years for both women and men. There were few deaths among the younger adults and adolescents, a group popularly associated with "drug abuse." We did find that "pure" propoxyphene deaths which were ruled accidental did occur at a younger average age (26), although the number (eight) was small. This is consistent with the data from Sturner and Garriott⁷ and with the BNDD report.²

There was good evidence that 65% of the propoxyphene victims committed suicide. However, many if not all of the 12 certified as undetermined and some of the less than thoroughly convincing accidents also may have been suicide. This statement reflects our conviction that rapid ingestion of enough pills (ie, 10 to 20 65-mg propoxyphene capsules) to cause death occurs as a result of a purposeful abuse by a knowledgeable person, an accidental ingestion by a curious child, or a deliberate consumption by a suicidal individual. Automatism has been a proposed mechanism in drug deaths but we and others disagree with the reasoning.^{13,14} Among the deaths which the OCME and local medical examiners agreed to classify as undetermined, many victims would have had to ingest 20 or more 65 mg capsules within a short period of time. Some of those ruled accidental due to high blood alcohol concentrations involved the subject quickly consuming 10 to 15 capsules. We estimate 80% to 85% of the persons dying from propoxyphene consumption committed suicide, leaving 15% to 20% for accidental and abuse-related deaths.

Women outnumbered men more than two to one among the clearly defined propoxyphene suicides (45 of 65). By comparison, the 1974 total drug suicide cases included 56 women and 27 men. Total suicides by all agents included 189 women, 507 men. There was no significant difference between the sex ratio in propoxyphene suicides and total drug suicides. The relatively larger proportion of men in the accident and undetermined manner of death group appears to be due to their greater frequency of alcohol consumption with drug abuse. We have not found that prejudice regarding gender and drug use was a significant factor in determination of manner of death, eg, assuming an overdose death was accidental rather than a suicide primarily because the victim was male.

We were not surprised to find that at least one quarter of the cases involved persons with a history of drug abuse and that 14 of these were alcoholics. Our autopsy data indicate that approximately one half of the 100 victims may have abused alcohol; over 50% had fatty changes in the liver. This finding does not contradict the death reports, for many of them are not detailed beyond the immediate circumstances of death. The 14