SUBSTANCE ABUSE IN TAIWAN AND THE ROLE OF CLINICAL TOXICOLOGY IN ITS PREVENTION AND TREATMENT

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Substance abuse used to be regarded as a world-wide problem, especially in the developed and developing countries. All these problems could be viewed from many different aspects, such as epidemiology, control acts, treatments and education, etc.

In Taiwan, this problem was also increasing significantly during the past ten years. Here, we would like to introduce these problems encountered and their responses, from the above viewpoints.

Epidemiological Observations

There was no such exact data available in the past decades, except those small scale studies about certain groups of the teenage students and the cumulative data of the drug related crimes. According to these data, we can see that rates of cigarette smoking among the teenage students varied widely from 10% to 50 %, depending on the different groups targeted. We have had no data about the alcohol use among the general population. Problems of glue-sniffing, hypnotics and pentazocine abuse happened since late 1960s, and were lasting till late 1980s.

From the statistics of the Ministry of Justice, we can easily find that drug related crimes were increasing sharply since 1990, particularly for those of heroin and amphetamines. The amphetamine use, mainly methamphetamine, began first and got nationwide in 1990. The number of its arrestees were less than 100 in 1989, 447 in 1990. However, the number increased up to 11,685 in 1991 and maintained around 20,000 to 30,000 annually since 1992. Unfortunately, numbers of heroin arrestees were also increasing significantly just behind the amphetamine ones. The heroin arrestees were 2,880 in 1990, 2,995 in 1991, which increased significantly up to 5,433 in 1992, and maintained around 10,000 annually since 1993. As for substances seized, the amounts of amphetamine were seldom before, and sharply increasing over 1,000 kg since 1990. It was nearly 7,000 kg in 1994. The

seized heroin also increased obviously since 1991, and peaked over 1,000 kg in 1993.

In fact, the Division of Clinical Toxicology of Taipei Veterans General Hospital (VGHTPE) sensed the epidemic in the very beginning since 1989, according to its cumulative data of Poison Control Center (PCC-VGHTPE) and Clinical Toxicology Lab. The PCC-VGHTPE has been opened to the public for more than ten years, and was the unique center in Taiwan during the methamphetamine epidemic. Because of the rapid increasing cases of consulting for methamphetamine poisoning since 1989, the PCC telephone became the most popular hot-line for the drug information not only for the health professionals, but also the general public. We can see from the three years' cumulative data, 1989-91. Totally, there were 730 cases of substance abuse reported from medical staffs, patients themselves, and their families or friends. Amphetamine abuse or its poisonings accounted for 72.7% of all the cases. The rests included 12.6% for cases of heroin, 6.4% for cases of hypnotics, 4.9% for cases of glue-sniffing. The male preferred amphetamine, glue, and heroin; while, besides amphetamine, the female favored hypnotics. Secobarbital, amobarbital and methaqualone prevailed in the past three decades, which were substituted by the benzodiazepines, such as diazepam, triazolam, and flunitrazepam, etc. Also, we had found 22 deaths related to amphetamine use. Most of them, about 86%, died of cardiac events. Besides the poison center, we have a clinical toxicology lab, which is open to all the medical facilities and even the general public here in Taiwan for the drug testiness. The tested substances include most of the hypnotics, stimulants, hallucinogens, narcotics, and some of the solvents. All positive screenings should further go through the mass gas chromatography for confirmation. Nearly one thousand testings were done yearly since 1989. Here, we also summarized the three years' data. Benzodiazepines accounted for 86.5% of all the positive sedative and hypnotics tests, while secobarbital,

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amobarbital and methaqualone were totally less than 3%. All the positive tests for stimulants were amphetamines, which were 15 positives in 1989, 198 in 1990, and 559 in 1991. Most of positive results for amphetamines were methamphetamine. Morphine (98%) appeared most frequently in positive tests for narcotics. The previously prevailed pentazocine got only four positive tests in these three years. There were seldom positive tests for marijuana, while cocaine, LSD or phencyclidine were never found.

Subsequently to the releasing of the above data to the public in 1989-90, some of the survey projects were then commenced. They included questionnaire study for high school students and urinary screening for amphetamines for the teenage students. Both the above were in nationwide bases. The programs for urinary screening were conducted once in every semester since 1990. In every semester, nearly ten thousands students were randomly selected from junior colleges, high schools, and even high grades of the elemental schools. In the average of ten semesters since the beginning, the selected students accounted for $0.30 \pm 0.18\%$ of the total population of these schools. The average positive rate for the ten semesters was $0.72 \pm 0.82\%$. As they were counted by each individual school category, the average positive rates varied from 0.00% in elemental schools to 0.85% in vocational high schools. However, the questionnaire studies were done almost in the same time and the same population, and revealed an overall rate of 1.3%. If the results by each school category were compared between the questionnaire study and the urinary screenings, it is interesting and some reasonable to find that some of the rates of questionnaire increased in times of the rates of urinary screenings. They were 1.41% versus 0.44% in junior colleges, 2.57% versus 0.85% in vocational high schools, and 0.77% versus 0.27% of the overall averages.

Reactions to the Epidemics and Problems.

Controls: There are two main regulations for controlling the licit and illicit substances in Taiwan, the Laws for Eradication of the Illicit Narcotics, and the Regulation for Controlling of the Narcotics. Unfortunately, the amphetamine epidemics came too fast for us to amend the unsuitable regulations, which partially accounted for the etiology of this epidemic. Therefore, initial activities against the epidemics started. They included listing amphetamines into the Regulations for Controlling of the Narcotics, schools against drugs, establishing the surveillance systems,

strengthening the capabilities and system of local and central laboratories for drug testing, enforcing the actions against the drug manufacturing, trafficking, dealing and using. Also, an ad hoc committee was initiated by the Department of Health to destine and coordinate all the actions smoothly and practically.

Education: There were many activities for different groups of population conducted through varieties of medias in the past years. Besides producing and disseminating the educational materials by the governments and private sectors, anti-drug information was incorporated into the curricula of all the schools, and training programs such as in military, and workplace.

Treatment: As the population of the drug dependence increased significantly in recent years, the treatment facilities in Taiwan are not sufficient in quantities and qualities. Opioid medications, such as methadone, or buprenorphine are not allowed for treatment of the drug dependence in Taiwan. Clonidine, benzodiazepines and other medications for symptomatic relief are currently used in Taiwan; although, the naltrexone program started to be a trial for people in probation. The adequate willingness of the people in the treatment facilities to offer their enthusiastic service is also a hot issue.

Other Perspectives: Many things are still left to be accomplished. The amendings of more suitable and timely regulations for the controlled substances and their practicable execution seem to be urgently needed for us. Also, some other related laws have just been legislated, such as the anti-money-laundry law. Enforcing the regional and international cooperation with mainland China, Hongkong, Thailand, Japan, the USA, and so forth seem also to be a very important issue now in Taiwan.

Functions and Roles of Clinical Toxicology in Substance Abuse

Practically, clinical toxicology is relevant to the substance abuse, not only in treatment, but prevention and control. They could be summarized in the followings. Taking an example of the Division of Clinical Toxicology in Veterans General Hospital, Taipei, Taiwan, there are four branches of jobs in it, including clinical inpatient and outpatient services, PCC, Clinical Toxicology Lab, and the Occupational Health Center. In patient services, besides treatments of drug overdose, we detoxify the drug addicts, do the clinical study from them, and also refer them for further psychiatric or rehabilitation treatments. As I have presented to you previously, the poison control center

could also be an important part in early warning network, particularly for those countries or areas without such a system. Also, it could play active roles in education and patient referrals, in addition to providing the drug and treatment information. As for the Toxicology Lab, besides the clinical drug screening tests and also being a part of early warning system. This lab also collaborated with the government and others to establish the guideline and system for further certification of the labs. The Occupational Health Center could help the workplace in drug control such as designing the drug testing and educational programs, and also other related employee assistant programs.