



Patterns of drugs & poisons in southern area of South Korea in 2014



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ABSTRACT

The southern area of South Korea consists of three parts; Busan, Ulsan and Gyeongsangnam-do. Busan Institute of National Forensic Service (NFS) performed about 50,000 cases throughout the southern area in 2014, occupying over 15% of total cases covered by NFS. In this study, patterns of drugs and poisons in the southern area of South Korea were investigated. The investigation was carried out by the laboratory information management system of NFS between January and December of 2014. As results, a total of 606 autopsy cases were performed by Busan Institute of NFS in 2014. Among them, 15 cases were determined as drug intoxication or poisons as the cause of death, taking up 2.5% of total cases: 5 cases of intoxication by drugs, 5 by agricultural pesticides, 3 by illicit drugs, and 1 each by detergents and chemical substances. A total of 108 drugs in postmortem bloods were detected from the autopsy cases, and the top 5 drugs were chlorpheniramine, tramadol, diazepam, zolpidem and lidocaine. Meanwhile, a total of 1,728 cases were submitted for illicit drug testing in 2014. Among them, hair was the most common type of specimens, and the rate of positive detection of methamphetamine from the hair, urine, and seized materials in the southern area was over 50% in all cases, indicating that this is the most commonly abused drug in South Korea. A total of 12 types of novel psychoactive substances (NPSs) were detected in the southern area in 2014; 10 were identified as synthetic cannabinoids and 2 as alkyl nitrites.

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1. Introduction

The National Forensic Service (NFS) of South Korea annually performs over 4000 autopsy cases connected with criminal investigations, and in 2014, approximately 5000 autopsy cases were handled by the NFS. The patterns of drugs and poisons detected in autopsy specimen analyses and submitted evidence provide a good resource for monitoring the current state of drug or poison use; however, an international report regarding the patterns of drugs and poisons in autopsies in South Korea has not been published. The NFS operates 5 local institutes (Seoul, Busan, Gwangju, Daejeon, and Daegu), among which the Seoul Institute handles the largest number of cases as it has jurisdiction over Seoul metropolitan area (Seoul, Incheon, and Gyeonggi-do), where 60% of the total population of South Korea is concentrated. On the other hand, the Busan Institute controls all cases arising in Busan, Ulsan,

and Gyeongsangnam-do in the southern area of South Korea (Fig. 1). The area of Gyeongsangnam-do including Busan and Ulsan is 12,344 km², which accounts for 12% of the total area of South Korea; the population in this area is approximately 8 million, accounting for 16% of the total population. Despite its relatively small area and population, the average rate of cases and accidents in this region is high: the total number of cases handled by the Busan Institute in 2014 was 48,167 according to the Annual Report of NFS [1], which was the highest after the Seoul Institute compared to all local institutes of NFS. Especially in 2014, Busan Institute handled nearly 15% of all cases investigated by the NFS (Fig. 2).

The present study investigated the patterns of drugs, poisons, and illicit drugs in southern area of South Korea, which were detected and identified by Busan Institute in 2014. Although the data presented focuses on the southern area of South Korea, it is a good source of information for understanding the current state of drug and poison use in South Korea.

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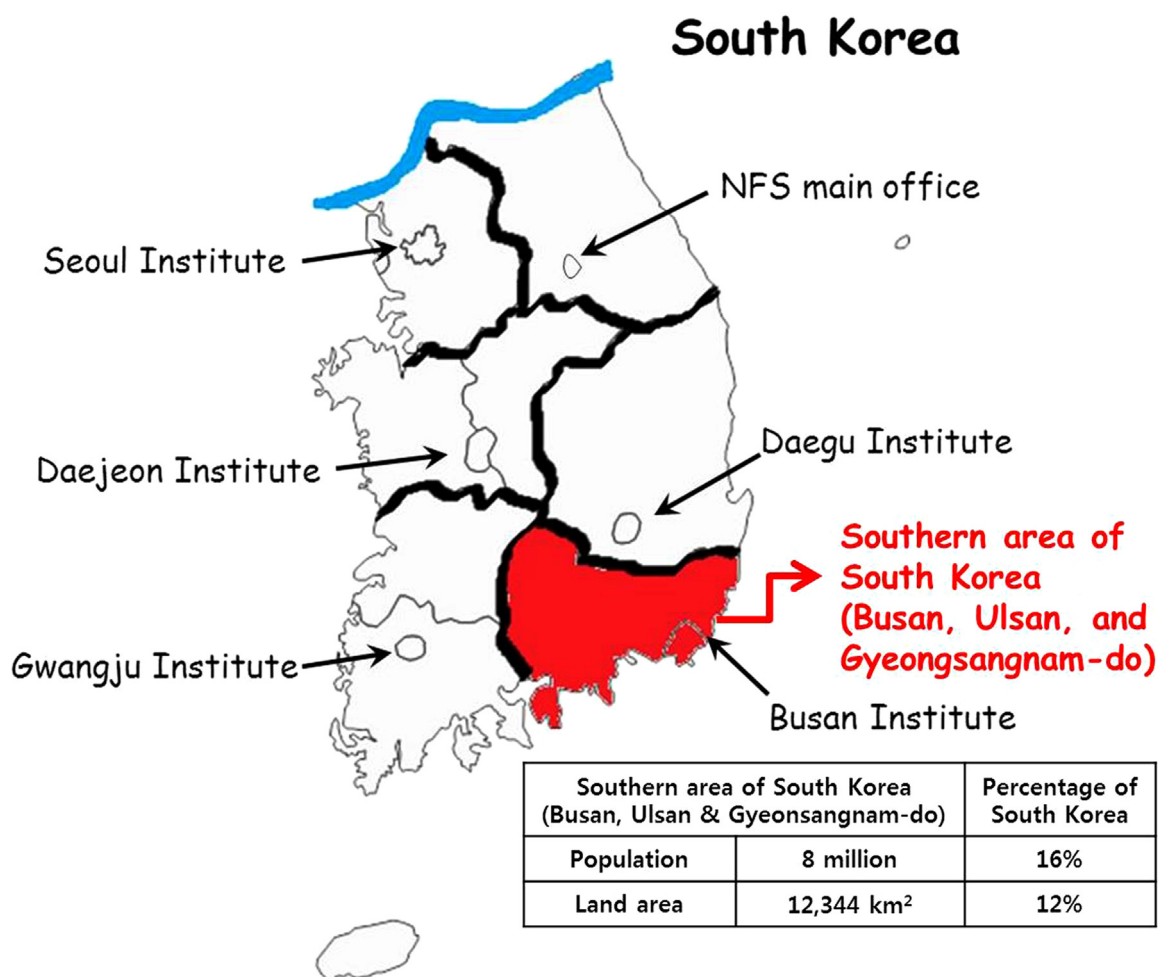


Fig. 1. Map of the southern area of South Korea and the locations of five local Institutes. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

[NFS consists of one main office and five local institutes (Seoul, Busan, Gwangju, Daejeon, and Daegu). The Busan Institute controls all cases arising in Busan, Ulsan, and Gyeongsangnam-do in the southern area of South Korea (black color)].

2. Methods

2.1. Period of analysis

The study examined the results of autopsy cases performed by the Busan Institute between January and December of 2014.

2.2. Materials

First, cases in which the cause of death was identified by autopsy as drug intoxication or poison were investigated. Second,

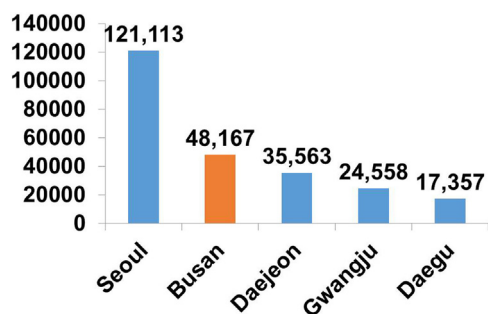


Fig. 2. Number of cases of five local institutes of NFS in 2014.

the type and frequency of the drugs detected in postmortem blood were examined. Third, the number of cases involving illicit drugs and the rate of positive detection of methamphetamine in each specimen were analyzed. In addition, novel psychoactive substances (NPSs) detected in the seized materials were investigated.

2.3. Methods

All materials were analyzed using the laboratory information management system, and the drugs and poisons in the specimens obtained from autopsy were detected by gas chromatography mass spectrometry (GC–MS) or liquid chromatography–tandem mass spectrometry (LC–MS/MS) analysis after the specimens were extracted by solid-phase or liquid-phase extraction by the analysis method used at the institute [2]. Briefly, for general drug screening, 1 mL of whole blood was taken and 30 μ L of internal standard for GC–MS (trimipramine- d_3 , 5 μ g/mL), 30 μ L of internal standard for LC–MS/MS (desipramine- d_3 , 0.5 μ g/mL) and 3 mL of 0.05 M phosphate buffer (pH 6.0) were added, vortexed and sonicated. After centrifugation, the upper layer was poured into a Chem-Elut[®] cartridge (Agilent Technologies, Santa Clara, CA, USA) and allowed to adsorb onto the solid support. The column had been activated with 2 mL of methanol and 2 mL of phosphate buffer. The column was washed with 1 mL of distilled water and 2 mL of 0.2 M acetic acid, and then acidic drugs were eluted into the test tube

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