The Use of Herbal/Traditional Products Supplementation and Doping Tests in Elite Athletes

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The aim of this study was to examine the use of herbal and/or traditional products supplements and doping tests among elite athletes. A questionnaire, which sought prevalence of the use of herbal/traditional products, the reason for taking supplements by the informants, information on demographical parameters, type of supplements, and doping consciousness, were completed by 228 athletes from 14 sport disciplines. Samples of the blood of 10 athletes were collected after they took herbal and/or traditional products, using the multi-stratified cluster random sampling method and were analysed by the doping control center in the KIST. The prevalence of oriental medicine usage is 53.5\% (male) and 62.2\% (female), and the reason for taking supplements was to improve recovery ability after exercise and training rather than to control conditioning. Relative gender-significant differences were observed in the subjects (male: self, female: parents) and doping consciousness (male: 73.7\%, female: 31.4\%). Tests of all the samples, according to the regulations of WADA anti-doping code, showed negative responses in 9 items and 210 substances. In conclusion, many herbal and/or traditional products were used as ergogenic aids despite a lack of evidence to support such claims. Moreover, there was difference between the doping consciousness levels in male and female. It was suggested that female athletes might need to increase their doping consciousness level.

\textit{key words:} Oriental medicine, WADA, Antidoping code, Doping consciousness

Introduction

More than 65\%-99\% of the elite athletes consume dietary supplements (Ahrendt, 2001; Erdman et al., 2006; Sundgot-Borgen et al., 2003) and those who consume doping-related substances were reported to be 3-5\% of the respondents (Kindlundh et al., 1998; Laure, 1997). The prevalence of supplement consumption increases significantly, especially for the top class athletes (Brill & Keane, 1994; Erdman et
The types of major sports nutrition supplements can be categorized as anabolic-androgenic steroid (Tokish et al., 2004) and endocrine stimulating prohormone (Delbeke et al., 2002), and nutrition supplementing substances (Ahrendt, 2001). The test about results of the doping can be determined based on effectiveness, safety, legal aspect, and ethical issues.

Most frequently utilized items of dietary supplements for elite athletes are a single vitamin or multi-vitamins, mineral, protein, amino acid powder, and creatine, and those are considered to be safe in terms of doping regulations (Kim et al., 2004; Chun et al., 2006; Cho & Lee, 2006; Erdman et al., 2006; Haymes, 1991; Massad et al., 1995; Sobal & Marquart, 1994a, 1994b; Sundgot-Borgen et al., 2003; Tokish et al., 2004).

However, compared to foreign athletes, Korean athletes consume more than 40% of supplements made from many different traditional products containing natural herbal substances. Substances in the traditional products such as cow testicles, Osmanthus heterophyllus (caffeine), leaves of Ilex aquifolium ‧ cornuta, roots of tea trees, leaves of tea trees, Strychnos nux-vomica, herba ephedra, roots of herba ephedra, Pinellia ternata Breit, Stephania cepharantha, Firmiana simplex Nak., cow penises, human urine, Ephedra equisetina Bge, Ephedra intermedia Schrenk et Mey should be carefully examined (KOC, 2004).

According to a report of 'The Independent', Strychnos nux-vomica L., which is classified as plant alkaloid, can provoke an excitement of the spinal reflex function, respiratory center, and vasoactive center and functional increase of the sensory center in brain cortices. Subsequently, a Chinese athlete who had been proven to be nux vomica positive in a doping test was suspended from the IOC in 1992. The newspaper reported a great concern for the Asian athletes who unknowingly consume traditional remedies (The Independent, 1992). Recently, a North Korean athlete showed a positive response in a doping test, and they suspected that it was due to the consumption of traditional herbal remedies(unpublished). The consumption of traditional herbal remedies was thought to affect athletes negatively (Yonhap News, 2008). However, it is thought that the influence of traditional herbs, which can be used as dietary supplements, depends on the purpose and the duration of the intake. Thus it can be recommended that they take safe measures of the herbs rather than with unconditional caution. The majority of elite athletes consume the remedies for improve recovery ability from muscle and central fatigue during training sessions. Also, most of them take the remedies out of the season, not at a