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Pharmacokinetic information on antibiotics for bacteria detected in the cooling phase of patients with induced hypothermia

Morio Kaburagi*[1)], Sakae Fukushima[1)], Keiko Ohno[2)], Satoshi Kishino[2)], Takashi Moriya[3)], Kosaku Kinoshita[3)], Nariyuki Hayashi[3)]

1）Department of Pharmacy, Nihon University School of Medicine Hikarigaoka Hospital
2）Department of Medication Use Analysis and Clinical Research, Meiji Pharmaceutical University
3）Department of Emergency and Critical Care Medicine, Nihon University School of Medicine

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Abstract

Objectives: We examined the distribution of bacteria detected in samples obtained from patients who underwent induced hypothermia and the pharmacokinetics of antibiotics administered for antibiotic prophylaxis in those patients.

Methods: In a retrospective survey at an emergency and critical care center in a university hospital, the medical charts of 51 patients who underwent induced hypothermia were reviewed. The types of detected major bacteria and interval until detection were investigated in those patients. We also measured concentrations of antibiotics administered to 11 patients with induced hypothermia and compared the pharmacokinetic parameters of the antibiotics during the cooling phase and the rewarming phase.

Results: Methicillin-resistant *Staphylococcus aureus, Pseudomonas aeruginosa* and *Candida* were mainly detected. The mean interval until detection of major bacteria was 4.4 days after the commencement of rewarming. Of the administered antibiotics, half-lives of agents that are mainly eliminated via kidney excretion (cefmetazole, flomoxef, sulbactam, arbekacin) did not differ in the cooling phase and rewarming phase. However, in a patient with severe liver dysfunction receiving cefoperazone (CPZ), an agent metabolized in the liver, the half-life of CPZ was markedly prolonged during hypothermia, whereas there was no prolongation in the other patients.

Conclusion: The results of the present study suggest that the types of bacteria detected in patients who have undergone induced hypothermia are similar to those in other critically ill patients. With respect to the pharmacokinetics of antibiotics, half-lives of antibiotics in patients with induced hypothermia did not differ in the cooling phase and rewarming phase. However, since the half-life of CPZ that metabolized in the liver was prolonged during the cooling phase, patients with severe liver dysfunction who undergo induced hypothermia should be monitored closely.

Keywords: hypothermia, bacteria detected, pharmacokinetics, antibiotic prophylaxis, drug metabolism

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ドリンク剤と作業能力に関する研究
－健常者を対象とした二重盲検試験－

井澤美苗[1)]、伊藤博之[1)]、島田英世[2)]、諏訪俊男[3)]、中島恵美*[1)]

[1)] 共立薬科大学薬剤学講座
[2)] 島田内科
[3)] 共立薬科大学臨床薬物評価学講座

EFFECT OF THE VITAMIN SUPPLEMENT DRINKS ON WORK PERFORMANCE
－A DOUBLE-BLIND, RANDOMIZED CLINICAL TRIAL ON HEALTHY VOLUNTEERS

Minae Isawa[1)], Hiroshi Itoh[1)], Hideyo Shimada[2)], Toshio Suwa[3)], Emi Nakashima[1)]

1）Department of Pharmaceutics, Kyoritsu University of Pharmacy
2）Shimada Clinic
3）Department of Drug Development Science & Clinical Evaluation, Kyoritsu University of Pharmacy

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Abstract
Purpose: The sale of the vitamin supplement drinks claiming a refreshing effect and greater energy is increasing, but their efficacy has not been examined in clinical trials. The purpose of this research was to clarify the effect of three types of these supplements on work performance in a double-blind, randomized clinical trial in healthy volunteers.
Methods: We used three vitamin supplement drinks: type 1 comprised vitamins, taurine, caffeine and alcohol, type 2 also contained several amino acids, and type 3 also contained several botanical herbs. Twelve healthy volunteers given these vitamin supplement drinks described the effects on a subjective scale in a self-reported questionnaire followed by an interview with a medical doctor. As an objective measure, work performance was examined using the Uchida-Kraepelin mental work test and WAIS-R (Japanese Wechsler Adult Intelligence Scale-Revised) test.
Results and Conclusion: The self-reported questionnaire indicated significant improvements in prevention of sleepiness and lack of energy. In both the Uchida-Kraepelin mental test and WAIS-R test, the mean amount of work was increased by the administration of the drinks, but without statistical significance. In conclusion, the efficacy of the vitamin supplement drinks seems to be primarily subjective.

Key words: the vitamin supplement drinks, clinical trial, self-reported questionnaire, Uchida-Kraepelin mental work test, healthy volunteers

はじめに

1999年における規制緩和で、栄養保健薬並びにビタミン含有保健薬（ドリンク剤）の一部が医薬部外品として一般販売市場に移り、ドリンク剤は手軽に入手できるようになった[1)]。医薬部外品を含めたドリンク剤の市場規模は最大となり（薬事工業生産動態統計年報14年度版)、ドリンク剤は、生活者の健康管理を支えるセルフメディケーションの普及を担う一般用医薬品の一つである。

ドリンク剤の効用は、滋養強壮、栄養補給、眠気の改善、疲労回復などと多岐に渡り、その種類は多種多様である。ドリンク剤は、ビタミン、タウリン、カフェインが含有されたものが基本となっている。更にアミノ酸、生薬成分等を含んでいるものがある。成分に対して薬効分類がされて

別刷請求先） 中島恵美（共立薬科大学）〒105-8512 東京都港区芝公園１－５－30