

Effects of Walking Style on in-vivo Biomechanical Parameters during Stair Walking

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The purpose of this study was to obtain fundamental knowledge about walking stairs safely by clarifying the effects of walking style on in-vivo biomechanical parameters. Kinematic, kinetic and electromyographic data during stair walking were measured under three conditions limbs during normal stair walking (NW), and leading limb (LL) and trailing limb (TL) when walking stairs one step at a time. Moments of force on joints, muscle tensions and joint forces were calculated by using two mathematical models (link segment model and musculoskeletal model, Yamazaki (1992)). When ascending one step at a time, the quadriceps of LL and the triceps surae of TL played important roles. They were the main functional muscles for lifting the body. Knee joint force of LL was greater than during NW, whereas that of TL was smaller. Muscle tensions of LL when descending was decreased by the action of the quadriceps and triceps surae of TL. When descending, Knee joint force of TL was bigger than during NW, whereas that of LL was much smaller. The results showed that: 1) In ascending, if a patient has any injuries of quadriceps or knee joint, the unaffected side should be made LL and the affected side TL. Also, if there is an injury of the triceps surae, the unaffected side should be TL and the affected side LL. 2) In descending, if there is an injury to one limb, the unaffected leg should be TL and the affected leg LL.

A Preliminary Study of High School Health Education

— An Overview of Freshmen's Awareness —

Mika SHIMANE

The actual instruction and the awareness of students about high school health education, especially in relation to other subjects in the school curriculum, were surveyed.

The subjects were 883 freshmen at two universities in OKAYAMA prefecture. They were asked about their high school health education during April and May, 1997.

Health education teachers consist of 97.3% health science and physical education teachers. 86.4% of teachers taught a regular two-unit curriculum. In advanced classes, 88.9% used only textbooks, whereas 83.8% used copies and other material. 78.9% of the subjects received health education and 39.3% felt that health education was as important as other subjects while 40.7% felt that it was more important. 59.9% regarded health education to be a useful subject for everyday life.

The subject of health education has become progressively more important. However, due to a teacher-oriented way of instruction, students have no chance to participate in and discuss problems in class more actively. In the future, this problem should be corrected. The subject of health education and other subjects should be more closely coordinated.

Quantitative Analysis of Creatinine and the Metabolites of Toluene and Styrene by High-Performance Capillary Electrophoresis

Toshiko FUJII and Satoko KAWABE

The aim of this study was to assess the possibility of using high-performance capillary electrophoresis (HPCE) to determine the urinary metabolites of toluene and styrene in the field of occupational hygiene,

while at the same time determining the endogenous urinary metabolite, creatinine.

HPCE was used to determine creatinine and hippuric acid in the urine specimens of 56 subjects exposed to toluene vapors, and urinary creatinine and mandelic acid of 13 subjects exposed to styrene vapors.

The compounds were well separated from each other on a fused silica capillary utilizing a 20mM sodium tetraborate buffer (pH 9.65) with 15mM β -cyclodextrin. Separation was achieved with a constant voltage of 15kV with a current of 50-55 μ A and UV absorption was determined at 200 and 225nm.

Results obtained with the cyclodextrin electrokinetic chromatography (CDEKC) method showed a good correlation with those by the high-performance liquid chromatography (HPLC) method with respect to urinary concentrations of creatinine, hippuric acid and mandelic acid. Furthermore, urinary creatinine concentrations determined by CDEKC correlated well with those determined by the Folin method.

Effects of Teas on the Amount of Slime Production of Coagulase-negative Staphylococci

Rei OIKE, Tomomi HIKASA and Hiroko MINE

Recently, it has been assumed that slime production by coagulase-negative staphylococci (CNS) was important as the cause of infections and much research has been done on the subject. Previously, measurements of the amount of slime were based on qualitative judgment by naked eyes. This study was an attempt to establish a quantitative measurement method.

The optimum conditions for slime production were set by comparing various plates and media. Slime which adhered to the plate wall was dissolved with hot PBS (-) after dyeing with fuchsin, and the absorption of the solution at 492nm was measured. Using this method, the amounts of slime for various CNS were measured and compared. Results showed that it was especially large in *Staphylococcus epidermidis*.

The influence of various teas and their components on slime production were examined and it was found that Japanese tea and tannic acid at sublethal concentrations greatly decreased slime production. Moreover, the effect of tannic acid was mirrored by its chemical components, (-) epigallocatechin gallate (EGCg) and (-) epicatechin gallate (ECg).

Studies on a Chemically Defined Medium for Coagulase

— Negative Staphylococci —

Tomomi HIKASA, Rei OIKE and Hiroko MINE

In this report, simple, chemically defined media suitable for coagulase-negative staphylococci (CNS) are described. Those media are composed of 14 to 17 amino acids as the nitrogen source, glucose as the carbon source and a commercial mixture of salts and vitamins. Using the deletion method, 14 essential amino acids out of 18 component amino acids of casein, 3 additive amino acids and 1 eliminative amino acid were determined. Eight kinds of chemically defined media with various combinations of 14 essential amino acids and 3 additive amino acids were prepared, and used to examine some properties of two species of CNS (*S.epidermidis* and *S.capitis*).

As a result, growth attached to the bottom of plastic petri dish and a low amount of growth were observed in *S.epidermidis* grown in 4 kinds of alanine free media. On the other hand, both *S.epidermidis* cultured in 4 kinds of alanine containing media and *S.capitis* cultured in all 8 kinds of media showed good and non-attaching growth.