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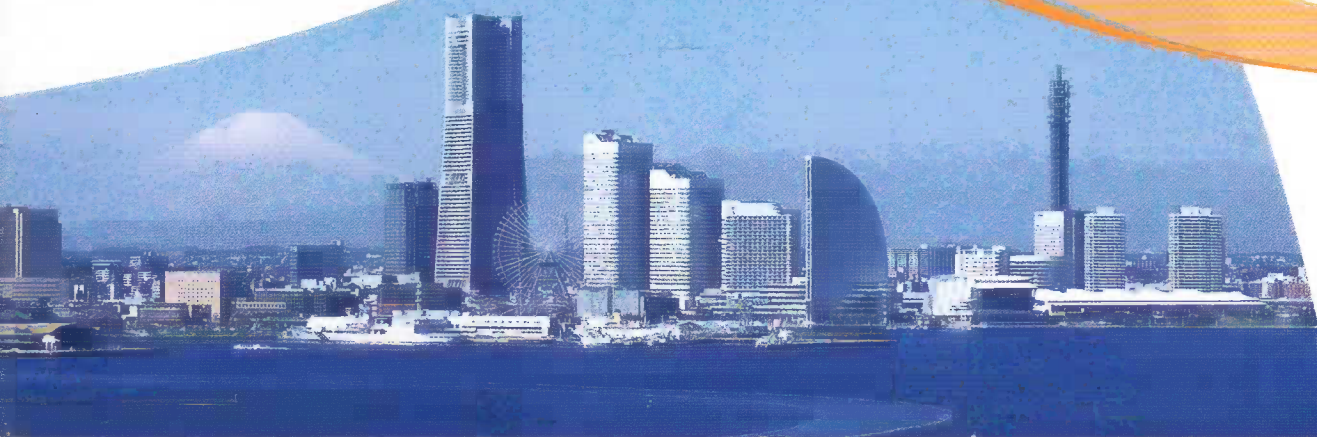
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## OS15-7

### Height Estimation in Thai Women from different South East Asian equations

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**Objective:** Knee height (KH) and arm span (AS) are the most frequently used in developing equation for height measurement in difficult cases. A few published studies in South East Asia countries have determined KH and AS measurement as an alternate methods for estimating height. The aim of this study is to find out the best height estimation equations derived from KH and AS.

**Materials and methods:** The study was conducted between September 2013 and April 2014. Six hundred and six Thai women (aged 18 - 59 years) living in Bangkok and nearby provinces, Thailand. Standing height, KH and AS were measured in duplicate. Correlation coefficient and Intra-class correlation coefficient (ICC) were used to analyze relationship between actual height and estimated height from Malaysia and Thailand models.

#### Results:

Mean and standard error (SE) of measured of height, KH, and AS in this study were 157.6(0.2), 49.3(0.1), and 160.1(0.2), respectively. The estimated height by KH were 160.9(0.1), 163.1(0.1), and 160.1(0.2) cm by Malaysia, the 1st, and 2nd Thai models, respectively. Estimated height from three KH equations correlated highly significant with measuring height ( $r=0.84$ ,  $p<.001$ ) as well as AS equation ( $r=0.83$ ,  $p<.001$ ). The concordance relationship between actual and estimated height by KH with Malaysia, the 1st, and 2nd Thai models were analyzed by ICC (95%CI) were 0.81 (0.78-0.83), 0.75 (0.72-0.79), and 0.56 (0.50-0.61), respectively whereas the concordance relationship between actual and estimated height by AS with Malaysia and 1st Thai models, were 0.83 (0.80-0.85), and 0.80 (0.78-0.83), respectively.

**Conclusion:** The Malaysia KH and AS- derived equations showed the best estimated height at this moment. The second developed equation in Thailand showed the lowest predictive power.

keywords: Estimated height, Knee height, Arm span

## OS16-2

### The roles of GPD1 in exercise capacity

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During high-intensity exercise, such as a sprint, ATP production depends on anaerobic glycolytic pathway. Maintenance of a cytoplasmic redox balance ([NADH]/[NAD<sup>+</sup>] ratio) is a necessity for sustained glycolysis. Several mechanisms are involved in adjustment of the redox balance and one of these is glycerol phosphate shuttle. Recent studies have suggested that mice lacking glycerol 3-phosphate dehydrogenase 1 (GPD1), which is the enzyme that plays a role of glycerol phosphate shuttle, are unable to maintain normal glycolytic intermediates and ATP levels in skeletal muscle after vigorous exercise. The result suggested that the inhibition of glycerol phosphate shuttle by GPD1 deficiency caused abnormality of glycolytic pathway and ATP production. Moreover, these changes might decrease exercise capacity. In this study, we examined the roles of GPD1 in exercise capacity and speculated the contribution of the glycerol phosphate shuttle to the ATP production during exercise.

Using GPD1 null mutant model BALB/cHeA mice (HeA mice), we examined exercise capacity by an exercise tolerance test. Simultaneously, we measured oxygen consumption and carbon dioxide production. BALBc/By mice (By mice) was used as a control. In HeA mice, exercise endurance and maximum oxygen uptake was significantly higher than By mice. During exercise, lipid oxidation was always higher in HeA mice than By mice, concomitantly with the increase in the phosphorylation of AMP activated protein kinase (AMPK). The amount of muscle glycogen usage during exercise was significantly lower in HeA mice.

These data suggest that lipid is the predominant fuel source for exercise in HeA mice and lacking of GPD1 increased exercise capacity by increasing lipid oxidation during exercise probably due to activation of AMPK. As for AMPK becoming easy to be activated, it was suggested that AMP/ATP was tend to increase by the GPD1 deficiency induced inhibition of glycolysis.

keywords: glycerol phosphate shuttle, AMPK, BALB/cHeA mice

## OS16-1

### Metabolism of Exogenous Acetic Acid Induces *glut4* Expression through Activation of AMP-Activated Protein Kinase in Rat L6 Myotube Cells

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Administered acetic acid is rapidly absorbed from digestive organs and excreted into the blood stream, and then easily incorporated and utilized in peripheral tissues such as skeletal muscle, one of the important tissues where glucose is actively transported from blood and regulates blood glucose levels. Following the absorption of acetic acid into the cells, acetic acid is thought to be converted to acetyl-CoA with concomitant formation of AMP by the catalytic activity of Acetyl-CoA synthetase. AMP is a well-known endogenous activator of AMP-activated protein kinase (AMPK) which has been shown to play a key role as a regulator of glucose uptake through the upregulation of glucose transporter type 4 (GLUT4) in skeletal muscle. In this study, we investigated whether acetic acid could increase GLUT4 expression through the activation of AMPK in skeletal muscle cells by using differentiated rat L6 myotube cells as a model of skeletal muscle cell. Treatment of acetic acid induced not only an increase in intracellular AMP/ATP ratio but also remarkable phosphorylation of AMPK and enhanced the enzyme activity of AMPK in L6 myotube cells. Expression of GLUT4 also increased in acetic acid-treated cells on both mRNA and protein levels. The effect of acetic acid on GLUT4 expression was completely suppressed by the pretreatment with compound c, a potent inhibitor of AMPK, indicating that acetic acid induces *glut4* transcription through the activation of AMPK in L6 myotube cells. Our results suggest that acetic acid is a candidate molecule that can control blood glucose level through the induction of GLUT4 expression in skeletal muscle cells and improve the pathological conditions of diabetes.

keywords: acetic acid, GLUT4, AMPK

## OS16-3

### Novel function of adenosine monophosphate to improve metabolic related-diseases in SHRSP

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Adenosine monophosphate (AMP) may bind to bitter-responsive taste receptors and has been approved by FDA as bitter blocker additive and flavor enhancer in some foods. The functional properties of AMP on the regulation of metabolic-related diseases remain unknown, therefore we investigated the effects of AMP in stroke-prone spontaneously hypertensive rats (SHRSP). Male-10 weeks old of rat were divided into three groups: a control group fed an AIN-93M diet and two others fed supplemental AMP (17.5 and 87.5 mg/kg diet) for 3 weeks. AMP ameliorated hypertension, plasma triglyceride, glucose, hepatic lipid, and enhances plasma nitric oxide, HDL-cholesterol, and adiponectin levels accompanied by the upregulation of mRNA expression levels of the hepatic adiponectin receptor 2. Single and chronic administration of AMP affected hepatic mRNA expression levels of genes involved in alpha-oxidation, fatty acid synthesis, AMP-activated protein kinase (AMPK). Furthermore, administration of AMP was also increased protein level of P-AMPKalpha. In conclusion, AMP is novel effect to ameliorate metabolic-related diseases in SHRSP and could be beneficial as functional food ingredients and nutraceuticals.

keywords: adenosine monophosphate, hypertension, glucose metabolism