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Serum salicylate in Thai healthy geriatric subjects

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Waenlor W, Wiwanitkit V, Suwansaksri J, Sangsuthum S. Serum salicylate in Thai healthy geriatric subjects. Chula Med J 2001 Oct; 45(10): 887 - 90

Objective : *To set expected value of salicylate in Thai healthy geriatric subjects*

Setting : *Department of Clinical Chemistry, Faculty of Allied Health Science, Chulalongkorn Univesity*

Subjects : *77 healthy elderly subjects who attended annual check up program*

Material and Method : *Serum from each subject was collected then analysis. Free serum salicylate level was analyzed by Keller's method. The average and expected range from all analyses were then calculated.*

Result : *From all subjects, the average level of serum salicylate was 1.64 ± 2.05 mg % (mean ± SD). The expected value of the Thai healthy geriatric subjects was 0-5.74 mg %*

Conclusion : *Expected value of serum salicylate among the subjects was rather high comparing to the younger groups. However, the expected value did not exceed the therapeutic level.*

Key words : *Geriatric, Serum salicylate.*

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วัตถุประสงค์ : *เพื่อศึกษาถึงระดับ serum salicylate ในผู้สูงอายุชาวไทยที่มีสุขภาพปกติ*

สถานที่ทำการศึกษา : *ภาควิชาเคมีคลินิก คณะสหเวชศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย*

ตัวอย่างที่ทำการศึกษา : *ผู้ป่วยสูงอายุชาวไทย ที่มีอายุมากกว่า 60 ปี ที่มารับการตรวจสุขภาพประจำปี*

วัสดุและวิธีการ : *ทำการเก็บตัวอย่างน้ำเหลืองจากผู้ป่วยแต่ละราย นำมาหาค่า serum salicylate ด้วยวิธีของ Keller จากนั้นนำมาหาค่าเฉลี่ย และค่าคาดหวังของระดับ serum salicylate*

ผลการศึกษา : *จากการศึกษาพบว่า ค่าเฉลี่ยของ serum salicylate ในกลุ่มตัวอย่างผู้ป่วยมีค่าเท่ากับ 1.64 $\pm$ 2.05 mg % (mean $\pm$ SD) และค่าคาดหวังเท่ากับ 0 - 5.74 mg %*

สรุป : *ค่าเฉลี่ยของ serum salicylate ในกลุ่มผู้สูงอายุชาวไทย ในการศึกษานี้มีค่าสูงกว่าระดับที่เคยรายงานไว้ในกลุ่มผู้ที่มีอายุน้อยกว่า แต่อย่างไรก็ตามค่าคาดหวังที่ได้จากการศึกษานี้ยังไม่เห กินระดับที่ใช้ในการรักษา*

คำสำคัญ : *Serum salicylate, ผู้สูงอายุ*

Antipyretic and anti-inflammatory drugs are widely used especially for those with salicylate acid composition. When salicylic acid is ingested into human body, it is hydrolyzed to form serum and urine salicylate. [1] If over dose of salicylic acid was consumed, it might causemany side effects including gastrointestinal tract bleeding, acid-base imbalance and intoxixation though in geriatric. [2] Therefore, serum salicylate analysis of patients who have ingested these drugs and are useful for the physician in monitoring the drug control level for prevention of salicylate intoxication.[3]

Due to the laboratory, Medicine principle examining the normal value or reference range of the population in each laboratory setting is necessary for interpretation of laboratory result.From literature review, although there has been a report of reference value for blood salicylate level among the Thais,[4] it did not concern the geriatric population, who are supposed to expose to the salicylic acid. Therefore, the authors performed this study in order to set a reference for serum salicylate among Thai geriatric subjects.

Material and Methods

Subject

All 77 individual elderly subjects (40 males, 37 females; aged > 60 years) of both sexes who were attended in the annual check up program of King Chulalongkorn Memorial Hospital were randomly selected into this study. All mentioned previous healthy status. No personal illness or drug use was revealed. All refused the history of habitual usage of drug containing salicylic acid.

Sample Collection

Clotted blood specimen from each subject was collected by anticubital venipuncture technique. 5 ml of blood sample from each subject was collected into vacuum tube. Then serum separation was performed. All sera were refrigerated at 4 degree Celsius before analysis. All analysis was performed within 3 days after specimen collection.

Laboratory analysis

Each sample was sent to the clinical Chemistry Laboratory Unit, Faculty of Allied Health Science, Chulalongkorn University. All analyses were performed at the room temperature according to the Keller's method. [3]

Statistical analysis

Descriptive statistical was performed where it was appropriate. The average level of serum salicylate was calculated as mean $\pm$SD. The expected range (mean $\pm$ 2 SD) was also calculated and used as reference range. Comparison of our data to the previous data from younger Thai adults groups in a previous published paper [4] was performed using unpaired T-test at significant level = 0.05

Results

From all subjects, the average level of serum salicylate was 1.64 $\pm$ 2.05 mg % (mean $\pm$ SD). The expected value of the Thai healthy geriatric subjects was calculated and shown in table 1. The reference range of salicylate in our study was 0-5.74 mg %

Table 1. Serum salicylate level in Thai healthy geriatric subjects.

Mean (mg %)	Standard Deviation(SD) (mg %)	Expected Range(X±2SD) (mg %)
1.64	2.05	0 – 5.74

Discussion

The average level from serum salicylate analysis in Thai healthy geriatric was more than 1 mg% (1.64 ±2.05 mg %), comparing to Keller's study which reported normal value less than 1.1 mg %. Concerning Keller's method used in this study, measurement of free salicylate was performed, which differs form the previous method, Trinder's method, which total serum salicylic acid was measuted.[5]

Furthermore, this salicylic acid test is quite rapid and convenient to examine intoxication because it does not has linear limited like to examine in lower dose. And it can finish within 5 minutes for examining the value in normal population and checking drug-level of patients.

Normally salicylic acid can be eliminated out within 6 hours after low dose ingestion. While the elimination will occur within 15-30 hours after ingestion of high dose. In the elderly, the salicylate becomes a common drug usage due to its effect in musculoskeletal pain relief. Nevertheless, salicylate intoxication in this population would not be early detected, as it must be hard when have taken for a long time and always taken into body. Hence it can bring accumulation with no disorder until intoxication. The therapeutic level of serum salicylate should not exceed 20 mg %, which the side defect, hearing loss starts to occur. If it had found approximately 30 mg % in serum, respiratory disorder such hyperventilation might happen. Therefore, the expected value of serum salicylate level may be higher than in younger group and worth to monitor.

Comparing the result from our 77 geriatric subjects to the result from the 280 younger adults, who is 20-60 years old in a previous study (expected value = 0.08),[4] a statistical difference (by two tailed unpaired t-test, $p < 0.05$) was observed. Although the expected value of serum salicylate among the subjects was rather high comparing to the younger groups, however, this expected value did not exceed the toxic level (20 mg %). Most of our subjects had serum salicylate level at 0-2 mg %. However, two cases with high level, up to 9 mg %, was also detected.

In conclusion, expected value of serum salicylate among the subjects was rather high comparing to the younger groups. However, the expected value did not exceed the therapeutic level.

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