TSH Reference Interval Study in Japan

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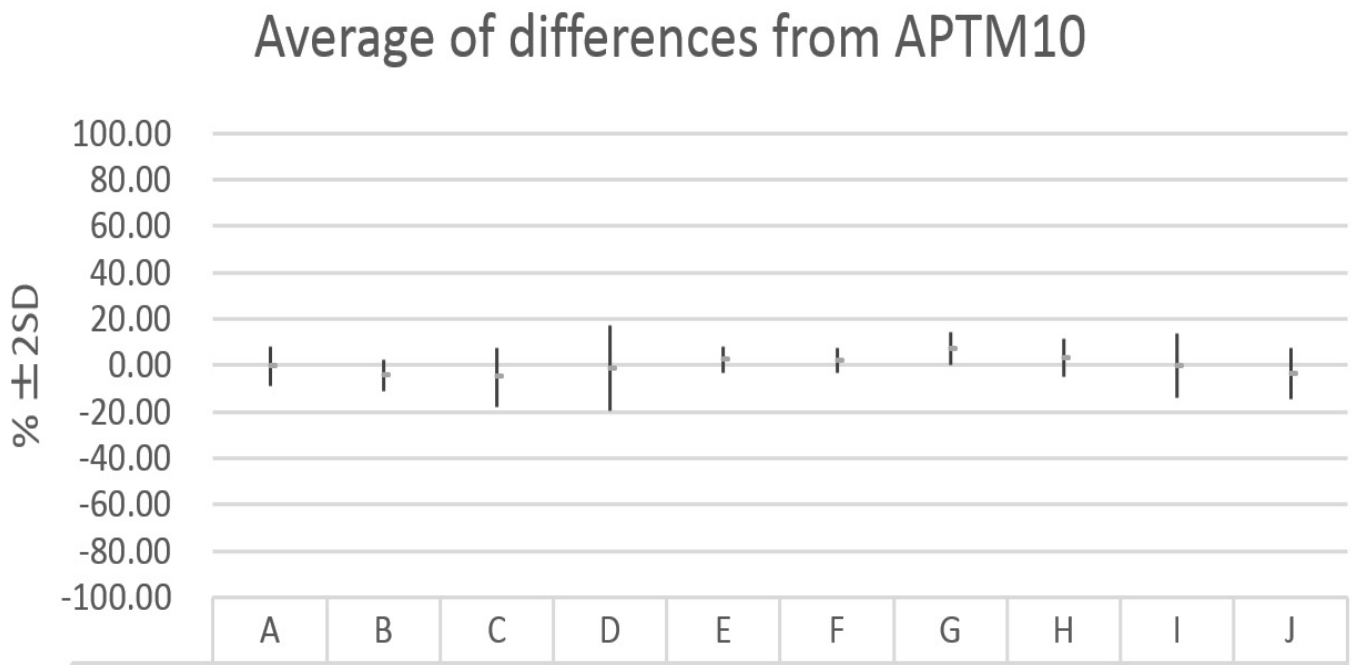
Background

- IFCC C-STFT (International Federation of Clinical Chemistry and Laboratory Medicine Standardization of Thyroid Function Tests) performed TSH harmonization study (phase IV, Clin Chem 2017;63:1248-60), which enabled 13 IVD manufacturers to report harmonized TSH values to clinicians.
- Japan Thyroid Association, Japan Society of Clinical Chemistry, Japanese Society of Laboratory Medicine, and Japanese Committee for Clinical Laboratory Standards, represented by Akira Hishinuma, approached Ministry of Health, Labour and Welfare of Japanese government (MHLW) to have TSH measurements harmonized.
- MHLW contacted Japan Association of Clinical Reagents Industries (JACRI).
- JACRI (all IVD companies) agreed to harmonize TSH.
- Committee of Standardization of Japanese Society of Laboratory Medicine planned and conducted the study with 10 IVD manufactures who have sales permission by MHLW.

Study Population

- 120 healthy individuals
  - Ages 20-60, Average BMI 21
  - No thyroid illness or serious disease (i.e. hepatic, renal, diabetes, endocrine, and others) is diagnosed to avoid non-thyroid illness.
  - No medication which affects thyroid function
  - No radiological examination with contrast medium containing iodide or radiation therapy in the neck
  - No OCT drugs for weight loss (Chinese drugs may contain thyroid hormone itself)
  - Not pregnant or lactating
  - Living in Japan
  - Normal values for total protein, AST, ALT, γ-GTP, Cre, Glucose, Na, K, Cl, Triglyceride, Total cholesterol, HBsAg, HCV Ab, HIV, TPO Ab, Tg Ab

	MEAN	SD
A	-0.34	4.21
B	-4.34	3.37
C	-5.15	6.47
D	-1.25	9.27
E	2.24	2.83
F	2.10	2.74
G	7.29	3.61
H	3.13	4.16
I	-0.18	6.96
J	-3.51	5.51



Distribution of reported results by manufacturer

The mean average differences of the IVD manufacturers from APTM10 were from -5.15% to 7.29%, whereas the highest SD of the IVD manufacturers was 9.27%.
Therefore, we judged that the phase IV study of C-STFT is assured
and the re-calibrated values will be used without further adjustment in Japan.

According to the above study, each IVD manufacturer is requested to report the IFCC C-STFT (phase IV) value by the end of March, 2021.
To obtain the phase IV values, the following coefficients should be multiplied to the current kit values which were listed in the phase IV study.
(The order of manufacturers is different from A～J of the previous slide.)

Marketing Authorization Holder in Japan	Assay Name	Instruments/platforms	coefficient
Abbott Japan Co.,Ltd.	ARCHITECT TSH	ARCHITECT i2000SR System	to be released
LSI Medience Corporation	STACIA CLEIA TSH	STACIA®	1.30
Ortho-Clinical Diagnostics	VITROS® TSH New	VITROS® 5600	new kit is planned
FUJIFILM Wako Pure Chemical Corporation	Accuraseed TSH	Accuraseed®	1.09
Siemens Healthcare Diagnostics K.K.	TSH3-Ultra	ADVIA Centaur XP	1.00
Sysmex Corporation	HISCLTSH Assay Kit	Automated Immunoassay System HISCL®-5000	1.07
Tosoh Corporation	ST AIA-PACK TSH	AUTOMATED IMMUNOASSAY ANALYZER AIA-2000	0.92
FUJIREBIO Inc.	Lumipulse® G TSH	Lumipulse® G1200	to be released
Beckman Coulter Inc.	Access HYPERsensitive hTSH（Cat. No. 33820）	Access2 Immunoassay System	to be released
Roche Diagnostics K.K.	Elecsys TSH （material number : 08429324190）	cobas e 601 module	0.98

The reference interval (RI) of Japanese adults (20～60 years of age) calculated by APTM10 is <u>0.61～4.23 mIU/L</u>.