



Gender Related Variations In Sternometal Distance Of Young Nigerians

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ABSTRACT

A useful screening test for risk of difficult laryngoscopy is the measurement of the sternometal distance (SMD). It has not been clearly shown to vary with height, age and gender in adult populations. We investigated this anthropometric index in one thousand, randomly selected undergraduate students of the University of Port-Harcourt. The mean values of SMD was 16.8 ± 1.6 cm for males and 15.9 ± 1.4 cm for females (significant at $P = 0.01$). The SMD had no relationship to the height and age of the subjects investigated.

Keywords: Sternometal Distance, Gender, Nigerian, Laryngoscopy.

The observation that individuals with a short neck may have difficulty during tracheal intubation has led to the development of the sternometal distance as an anatomic indicator of the risk of difficult laryngoscopy (AI Ramadhani et al, 1996). The sternometal distance is defined as the distance of the neck in the midline from the mentum to the superior margin of the sternal notch with the neck in full extension (Wilson et al, 1998, Thomas et al, 2004). Although its value as a useful preanaesthetic test remain inconclusive (AI Ramadhani et al, 1996; Merah et al, 2005), at least one study has shown that it is more sensitive and specific than the more popular mallampati test, thyrometral distance and forward protrusion of the mandible when a cut-off point of 12.5cm is taken into consideration. (Savva, 1994).

Much of the studies on sternometal distance have been restricted to assessing its clinical value as a predictor of difficult laryngoscopy. Large scale population evaluation of the baseline values of this anthropometric index and its relationship to other biologic variables is lacking. This study therefore aims to determine the mean values of sternometal distance and assess its relationship to gender, height and age of a young Nigerian population.

MATERIALS AND METHOD

A thousand subjects from the undergraduate population of the University of Port-Harcourt were selected by random

sampling. Their sternometal distance was determined by measuring in the midline the distance between the sternal notch and the tip of the mandible (mentum) with the neck in full extension and the mouth closed by the use of a non stretchable measuring tape (AI Ramadhani et al, 1996). The height of each subject was measured against a wall-mounted gauge calibrated in centimeters and estimated to the nearest 0.5cm. The age of subject was also recorded. Obtained data were subjected to statistical analysis using the SPSS data analysis software.

RESULTS

Of the 1000 sampled subjects, 447 were males while 553 were females. The age range of subjects was 16-44 years with an average of 30 years. The height range was 144-195cm. The range of sternometal distance (SMD) for the sampled population was 12.0-21.0cm.

Table 1 shows the frequency distribution of SMD to sex and height of the subjects. The mean values of SMD was 16.8 ± 1.6 cm for males and 15.9 ± 1.4 cm for females ($P < 0.01$). Although the female subjects observed to be taller than the males, this difference was not statistically significant.

Table 2 is a comparison between subjects who had SMD of 12.5cm or less and subjects who had SMD greater than 12.5cm. 8(0.8%) subjects had SMD equal or less than 12.5cm while 992 subjects (99.2%) had SMD greater than 12.5cm. Among subjects whose SMD was less than 12.5cm, 2 were males while

6 were females ($P < 0.05$). Among and between subjects whose SMD was equal or less than 12.5cm and those who had SMD greater than 12.5cm, height was not a significant determinant of the sternomental distance.

Table 3 shows the frequency distribution of the SMD in relation to the age of the subjects. Significant age-related variation in SMD could not be demonstrated ($P > 0.05$).

Table 1: Mean SMD Related To Mean Height and Gender

Gender	n = 1000	Mean SMD (cm)	SD	P value	Mean Height(cm)	SD	P
Male	447	16.78	1.60	<0.01	170	0.09	>0.05
Female	553	15.90	1.39		190	6.81	

Table 2: A Comparison Between Subjects Who Had A SMD Of Less Than Or Equal To 12.5cm And Subjects With SMD Greater Than 12.5cm.

SMD of subjects	n=1000	Mean SMD (cm)	P	Mean Height (cm)	P	Gender	n=1000	Mean SMD (cm)	P	Mean Height (cm)	P
≤12.5cm	8	12.13	<0.05	161	>0.05	Male	2	12.00	<0.05	165	>0.05
						Female	6	12.17		160	
>12.5cm	992	16.28		181		Male	445	16.70		169	
						Female	547	15.94		195	

Table 3: Frequency Distribution Of SMD In Relation To Age Range Of Subjects

Age	n = 1000	Mean SMD (cm)	Range of SMD (cm)	SD	P
15 – 20	493	16.25	12.0 – 20.0	1.54	>0.05
21 – 25	443	16.21	12.0-21.0	1.52	
26 – 30	59	16.55	13.0-21.0	1.64	
>30	5	15.80	15.0-17.0	0.84	

DISCUSSION

This study has demonstrated that males have a significantly greater sternomental distance than females and that for the target population, SMD is independent of age and height. The population of subjects at a possible risk of difficult laryngoscopy was small, using the cut-off point of 12.5cm, and consisted mostly of females.

AI Ramadhani et al (1996) had evaluated the sternomental distance of 523 obstetric preanaesthetic patients of Arab origin with a similar average age as that of our sampled population, and observed no association between sternomental distance and age, height, weight and body mass index. In their study, as much as 14% of the target population could be at a possible risk of difficulty during endotracheal intubation. This is in contrast to the 1% at risk of difficult endotracheal intubation demonstrated by our study. The marked difference in the population at risk as observed between these two studies could be explained by anthropological differences among races.

CONCLUSION

Significant gender related variation exists in the SMD of young Nigerian population and females albeit a small proportion are at greater risk of difficult intubation using the sternomental distance as a predictive index.

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