

HEIGHT PREDICTION FROM ANTHROPOMETRIC LENGTH PARAMETERS IN HEMODIALYZED PATIENTS

Rodolfo Valtuille ¹, Maria Elisa Casos ¹, Mariana Gimenez ², Alicia Egolf ², Hector Moretto ²
¹ FME Burzaco & ² FME Quilmes, ARGENTINA. E-mail: rvaltuille@gmail.com

INTRODUCTION AND AIMS

- Obtaining an accurate height (H) estimate is important for normalizing body components (BC) such as body mass index(BMI) or body surface area (BSA) in hemodialysis patients(pts).
- However, measuring H in this population can be difficult in individuals who have various physical anomalies such as osteodystrophy or sarcopenia related to malnutrition and aging.
- The use of wheelchairs or prolonged hospitalization in pts with serious mobility impairment that precludes standing are frequent situations.
- Demispan, knee or ulna length have been proposed for use as potential estimates in HD pts.

The aim of this study is to compare H measured in standing position with H predicted by measurement of demispan, knee and ulna length to determine if there are discrepancies between them and to normalize body components: weight(W), Lean tissue mass(LTM) and fat tissue mass (FTM) ($BMI=W/H^2$, $LTI=LTM/H^2$ and $FTI=FTM/H^2$) delivered by Body Composition Monitor(BCM).

PATIENTS AND METHODS

We enrolled 302 pts(44% women and 24%diabetics.Age(years)=58±15.Vintage on HD(years)=5.6±6.7) from 2 centers with at least one measurement with the BCM.

BC measurements were assessed by means of a portable whole body BIS device (BCM)

HEIGHT: was measured with the patient standing with bare feet, without shoes and the head against the measuring device.

Length of arm demispan, length of forearm(ulna) and knee height were made as described in EGBP(CITA)

To compare Measured H & predictors we used T test, error analysis (mean error(ME)& root square mean error(RSME)) and BLAND-ALTMAN analysis.

RESULTS

n	All (302)	Center B (118)	Center Q (184)	p
Measured H	1.62(0.09)	1.62(0.09)	1.62(0.10)	ns
Demispan	1.64(0.1)	1.62(0.08)	1.65(0.10)	ns
Knee	1.72(0.09)	1.7(0.08)	1.73(0.10)	ns
Ulna	1.71(0.09)	1.66(0.07)	1.73(0.10)	ns
BMI(kg/m ²)	27.8(5.3)	27.5(4.4)	28(5.8)	ns
LTI(kg/m ²)	11.7(3.2)	12.07(3.5)	11.4(3)	ns
FTI(kg/m ²)	14.6(6.2)	12,5(4.9)	16(6.6)	0.05
Age(yrs)	58(15)	59(15)	58(15)	ns
Vintage HD	5.6(6.7)	6(8.4)	5.3(5.4)	0.04

Table1 - Summary of Pts Characteristics, Measured and Predicted Height and Body components by BCM(mean(SD))

Measured-Predicted	ME	RSME%	BLAND-ALTMAN
Demispan	-0.02(0.06)	4.9(4.3)	-0.02(0.1-0.04)
Knee	-0.09(0.05)	9.7(5.4)	-0.10(0.02-0.21)
Ulna	-0.09(0.06)	9.3(6.4)	-0.09(0.05-0.23)

Table2 - Analysis of error and Agreement (Measured and predict H)(mean(SD) and mean (CI))

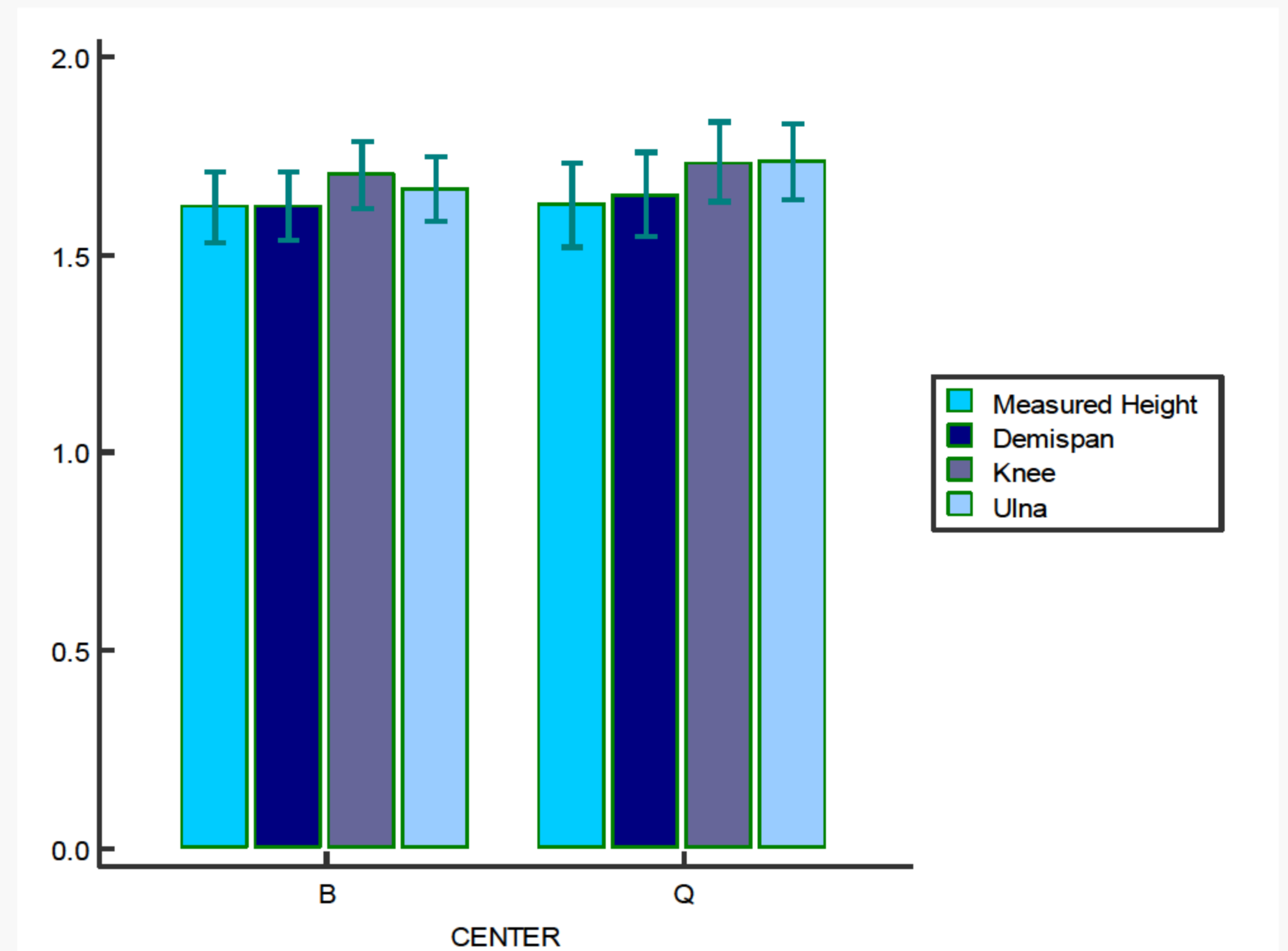


Figure1 - Comparison Between measured H and Predicted H from Demispan, Knee and Ulna Length

Height	measured	Demispan	Knee	Ulna	p
	1.62(0.09)#	1.62(0.06)*	1,70(0.08)**	1.66(0.07)***	# vs * ** *** <0.001
BMI	27.05(4.5)#	27.5(5)*	25(4)**	26(4.6)***	# vs ** *** <0.001
LTI	12.07(3.5)#	11.8(3.4)*	11(3.2)**	11.2(3.3)***	# vs ** *** <0.001
FTI	12,4(4.9)#	12.8(4.9)*	11.2(4.3)**	11.2(4.6)***	# vs ** *** <0.001

Table3 - Height and Body components derived from measured and predicted Height.Mean (SD).

- All H estimators(demispan, knee and ulna length)overestimated and differed significantly from Measured H in standing position in both centers. (tables 1 & 3) (Figure1)
- Demispan showed the lowest E and the best agreement. (Table2)
- E correlated with Age(0,27) and inversely correlated with measured H when knee(-0.38) and ulna (-0.36) length were used as predictors.
- Error was higher in males and showed differences between centers.
- When we used H estimated from knee or ulna BMI, LTI and FTI decreased significantly.
- In our study demispan showed accuracy to predict H so as to normalize body components.

CONCLUSIONS

The measurement methods to estimate H yields significantly different values for both, H and to normalize BC. In our experience arm demispan length was the most accurate H estimate for our HD pts.

These findings should be considered in a population with frequent physical disabilities, aging and geographical disparities