JULY 12–16 2020 VIRTUAL JOINT AAPM | COMP MEETING
EASTERN TIME [GMT-4]

A Body Mass Index-Based Method for Size-Specific Dose Estimates (SSDE) in Adults

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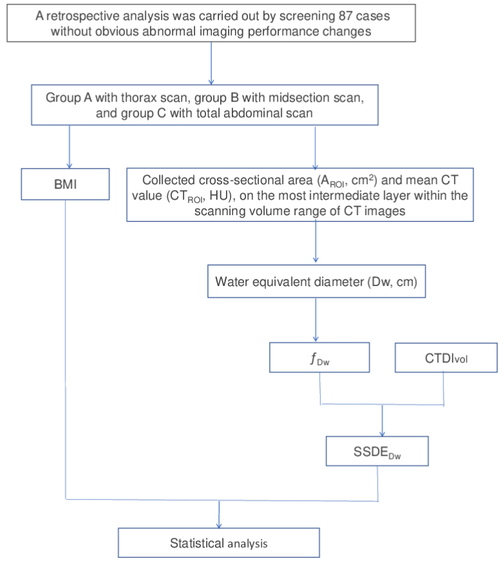
INTRODUCTION

- This study compares the relationship of size-specific dose estimates of multi-site CT with BMI in the enrolled adult patients.
- At present, there are few approaches for CT examination related prospective detection of dose with relatively high accuracy.
- The proposed method in our study can easily obtain BMI-based size-specific dose estimates prior to CT examination.

AIM

To propose a body mass index (BMI)-based method for size-specific dose estimates (SSDE) during computed tomography (CT) examination in adults.

METHOD



RESULTS

- The selected patients were divided into three groups: group A with thorax scan, group B with midsection scan, and group C with total abdominal scan.
- There was statistical significance in the difference of BMI and $SSDE_{Dw}$ as well as the correlation analysis among group A with thorax scan, group B with midsection scan, and group C with total abdominal scan (Table 1 and Figure 1).
- Statistical differences were also found in Dw, f_{Dw} and $SSDE_{Dw}$ among the three groups (Table 2).
- Besides, there was certain correlation of BMI with Dw and f_{Dw} (Figure 2 and Figure 3).

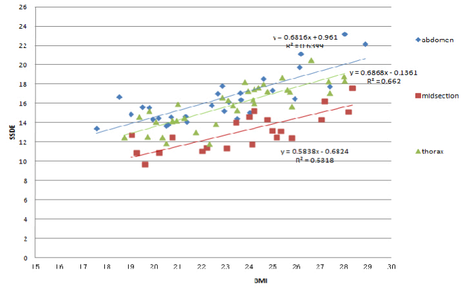


Fig.1.The correlation in BMI and $SSDE_{Dw}$ among the three groups.

Table 1. The statistical differences in BMI and $SSDE_{Dw}$ and correlation in BMI and $SSDE_{Dw}$ between group A , group B and group C through paired sample t-test analysis.

Group	t	R^2	P
A	29.261	0.66	<0.01
B	27.837	0.63	<0.01
C	19.065	0.64	<0.01

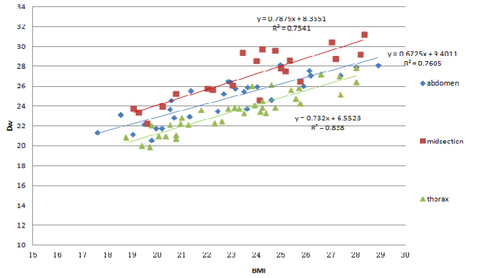


Fig.2.The correlation in BMI and D_W among the three groups.

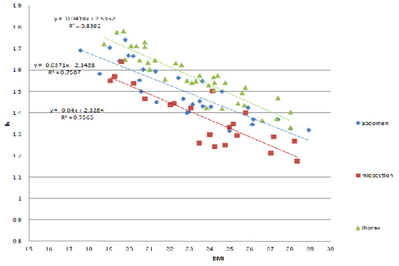


Fig.3.The correlation in BMI and f_{Dw} among the three groups.

Table 2. The statistical differences in D_W , f_{Dw} and $SSDE_{Dw}$ among the three groups through one-way anova analysis.

	F	P
Dw	17.363	<0.01
f_{Dw}	16.419	<0.01
$SSDE_{Dw}$	12.876	<0.01

CONCLUSIONS

The BMI-based method may be effective to estimate size-specific radiation dose based on Dw value.

REFERENCES

1 **Andrew,Daudelin**,David,Medich,Syed Yasir,Andrabi,Chris,Martel.Comparison of methods to estimate water-equivalent diameter for calculation of patient dose.[J].*Journal of applied clinical medical physics,2018,19(5):718-723.*
2 **Shuai**, Leng,Maria, Shiung,Xinhui, Duan,Lifeng, Yu,Yi, Zhang,Cynthia H, McCollough.Size-specific Dose Estimates for Chest, Abdominal, and Pelvic CT: Effect of Intrapatient Variability in Water-equivalent Diameter.[J]*Radiology,2015,277(1):308-9.*
3 **Bashier**, E. H., & Suliman, I. I. (2018). Multi-slice CT examinations of adult patients at Sudanese hospitals: radiation exposure based on size-specific dose estimates (SSDE).[J]. *La Radiologia Medica, 123(6), 424–431.*

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