Cross-sex hormone therapy affects body fat distribution in transgender persons

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Background

Fat distribution is an important secondary sex characteristic, which is generally peripherally or pear-shaped (gynoid) in females and centrally or apple-shaped (android) in males. Total body fat increases in male-to-females (MtFs) and decreases in female-to-males (FtMs) during cross-sex hormone therapy (CSHT), approaching body fat amounts of the desired sex. However, changes in android or gynoid fat distribution might be a better measure for masculinization and feminization than changes in amount of body fat per se. As yet, it is unknown what are the exact effects of CSHT on fat in the android- and gynoid region and whether these outcomes are more affected by CSHT than other measures.

Aim

To examine the effects of CSHT in MtFs and FtMs on android fat and gynoid fat and to compare these outcomes as measures of masculinization and feminization to other measures of body composition.

Methods

Population: This prospective study (ENIGI) included 108 patients that completed one year of CSHT.

Medication: 51 MtFs received Androcur® 50mg/day and Progynova® (4mg/day) or Systen® (100mcg/h), while 57 FtMs were treated with Androgel® (50mg/day), Sustanon® (250mg/2weeks) or Nebido® (1000mg/12 weeks).

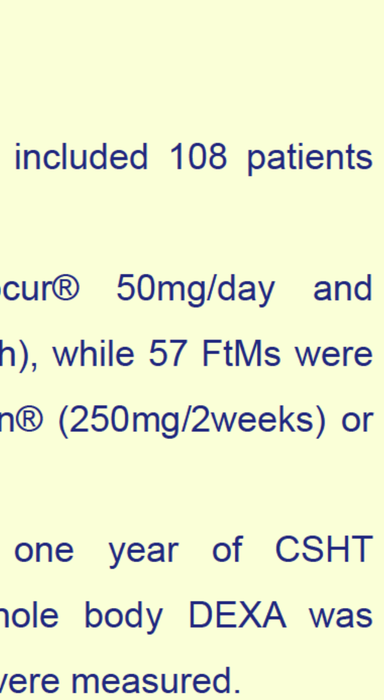
Measurements: At the start and after one year of CSHT anthropometrics were measured and a whole body DEXA was obtained, in which android fat and gynoid fat were measured.

Android region:

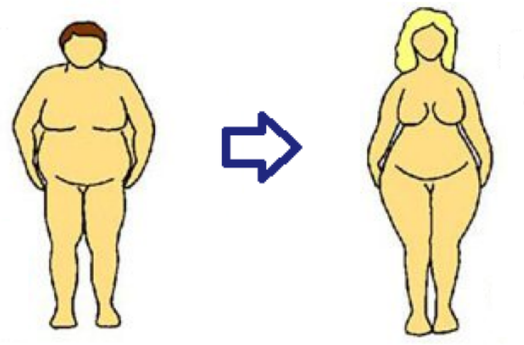
Area between the ribs and the pelvis. Upper demarcation: 20% of the distance between the iliac crest and the neck. Lower demarcation: top of the pelvis.

Gynoid region:

Hip and upper thigh region. Upper demarcation: below the top of the iliac crest at a distance of 1.5 times the android height. Total height: two times the height of the android region.



Male-to-female transgender persons

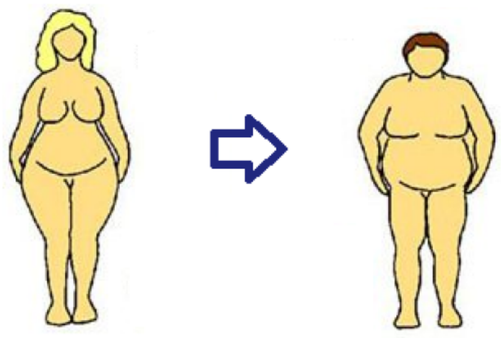


Android fat: + 0.2 kg (0.1;0.4) from 1.4 kg to 1.6 kg

Gynoid fat: + 0.9 kg (0.6;1.3) from 3.0 to 3.9 kg

Total body fat: + 4.0 kg (2.5;6.1) from 17.6 to 21.6 kg
Waist-hip ratio: -0.03 (-0.01;-0.05) from 0.86 to 0.83

Female-to-male transgender persons



Android fat: +0.1 kg (-0.02;0.2) from 1.6 to 1.7 kg

Gynoid fat: -0.6 kg (-0.5;-0.7) from 4.6 to 4.0 kg

Total body fat: -1.9 kg (-0.8;-2.5) from 23.2 to 21.3 kg
Waist-hip ratio: + 0.02 (-0.01;0.03) from 0.81 to 0.83

Changes in all measures of body composition in MtFs

	Start of therapy	Change in %	Confidence interval
Body weight (kg)	73.3 kg	+3%	0.4%;5%
BMI (kg/m2)	23.0	+1%	-3%;2%
Total body fat (kg)	17.6 kg	+23%	16%;31%
Gynoid fat (kg)	3.0 kg	+30%	22%;39%
Android fat (kg)	1.4 kg	+14%	5%;25%
Waist (cm)	81.5	-1%	-3%;1%
Hip (cm)	95.1	+3%	1%;5%
WHR	0.86	-4%	-6%;-1%

Changes in all measures of body composition in FtMs

	Start of therapy	Change in %	Confidence interval
Body weight (kg)	68.9 kg	+5%	3%;7%
BMI (kg/m2)	24.8	+5%	4%;6%
Total body fat (kg)	23.2 kg	-8%	-12%;-3%
Gynoid fat (kg)	4.6 kg	-13%	-17%;-9%
Android fat (kg)	1.6 kg	+4%	-2%;11%
Waist (cm)	79.9 cm	+2%	-1%;5%
Hip (cm)	98.7 cm	0%	-2%;3%
WHR	0.81	+2%	-1%;4%

Conclusion

In MtFs, CSHT causes a more gynoid fat distribution with a decrease in waist-hip ratio. In FtMs, a trend towards a more male fat distribution with a decrease in gynoid fat is observed. Gynoid fat shows the largest percentual change after one year of CSHT in MtFs and FtMs and seems to be a sensitive marker for cross-sex hormone action.