

Health-related quality of life is reduced in treated primary hypothyroidism and with lower FT3/FT4-ratio

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Background

Despite adequate treatment with LT4 monotherapy, many patients with primary hypothyroidism still report complaints, as this treatment can not exactly imitate the endogenous homeostasis (1).

Aim

We examined whether the different domains of HR-QOL were affected by the existence of a thyroid disorder and use of LT4 substitution, and whether a lower ratio of FT3 to FT4 could predict lower HR-QOL

Results

Mean (\pm SD) age was 51 \pm 13 years and BMI 26.9 \pm 4.7 kg/m² in the LT4 users, vs. 45 \pm 12 years and 25.8 \pm 4.1 kg/m² in the non-users; 90% of LT4 users were females. We observed considerably higher FT4 and lower FT3 levels in LT4 users, with the FT3/FT4-ratio being 25% lower in LT4 users, despite similar TSH levels in both groups.

Of the LT4 users, 50% had a FT3/FT4-ratio which was below the 2.5th percentile of euthyroid individuals. LT4 users reported poorer HR-QOL, the largest reduction was observed in physical functioning, bodily pain, general health and vitality. In the non-LT4-users, those in the lowest tertile of the FT3/FT4-ratio reported a significantly lower HR-QOL in the domains physical functioning and bodily pain compared to participants in the middle and highest tertile.

Table 1. Demographics, thyroid parameters and HR-QOL scores

	Non-LT4-users	LT4-users	P-value
Males / females	12,707 / 15,876	39 / 328	<0.001
Age (years)	45 \pm 12	51 \pm 13	<0.001
BMI (kg/m ²)	25.8 \pm 4.1	26.9 \pm 4.7	<0.001
TSH	2.15 \pm 0.88	2.15 \pm 1.12	NS
FT4	15.8 \pm 2.0	18.4 \pm 2.9	<0.001
FT3	5.3 \pm 0.6	4.6 \pm 0.7	<0.001
FT3/FT4 ratio	0.34 \pm 0.05	0.26 \pm 0.05	<0.001
Physical functioning	95 (90-100)	90 (80-95)	<0.001
Bodily pain	90 (78-100)	80 (67-100)	<0.001
Vitality	84 (72-88)	65 (50-75)	<0.001
General health	75 (65-85)	70 (55-80)	

Data as n, meanSD, or median (IQR)

Major findings

Patients treated with LT4 monotherapy for primary hypothyroidism report lower HR-QOL compared to non-users and healthy control subjects. In subjects not using LT4, a lower FT3/FT4-ratio was associated with more impairments in some domains of HR-QOL.

References

1. Gullo D, et al. PLOS One 2011; 2. Stolk RP, et al. Eur J Epid 2008; 3. Hays RD, et al. The Psychological Corporation 1998.

Methods

A total of 28,950 Western European participants from the population-based LifeLines Cohort Study (2), with normal thyroid stimulating hormone (TSH) values (0.4-4.5 mU/l), were evaluated; 367 of them used LT4 monotherapy. TSH, free thyroxine (FT4) and free triiodothyronine (FT3) were measured with electrochemiluminescent immunoassay on the Roche Modular E170 Analyzer. HR-QOL was assessed with the Short Form-36 questionnaire (3). Scores in the individual HR-QOL domains range between 0-100 (best), and we calculated the number of participants with an abnormal score. Their scores were compared with those in the general population (non-LT4-users), but also with a healthy group of participants without relevant co-morbidity or medication use for any medical reason.

Table 2. Health-related quality of life in LT4 users compared to non-users, and to healthy control subjects without co-morbidity

	Men	Women	All
Healthy controls w.o. med's, N	8,454	7,832	16,286
Physical functioning < 85 (%)	7.9	12.8	10.2
Bodily pain < 70 (%)	15.2	21.9	18.4
General health < 65 (%)	18.3	16.7	17.5
Vitality < 60 (%)	18.4	23.8	21.0
Non-LT4-users, N	12,707	15,876	28,583
Physical functioning < 85 (%)	11.8	18.5	15.5
Bodily pain < 70 (%)	18.6	27.6	23.6
General health < 65 (%)	23.0	22.6	22.8
Vitality < 60 (%)	20.4	27.8	24.6
Subjects using LT4, N	39	328	367
Physical functioning < 85 (%)	18.4	33.5	32.0
Bodily pain < 70 (%)	18.4	39.0	36.8
General health < 65 (%)	28.9	36.6	35.8
Vitality < 60 (%)	36.8	39.6	39.3

Table 3. Relevant health-related quality of life domains according to the FT3/FT4 ratio (tertiles) in non-LT4-users

	Tertile 1	Tertile 2	Tertile 3	P-value
Physical functioning <85 (%)	16.9	15.1	14.6	<0.001
Bodily pain <70 (%)	24.1	23.3	22.7	0.007
General health < 65 (%)	22.2	22.2	23.9	NS

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