



A study of the association between equol-producing status and female LUTS

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Abstract

【Aims of Study】 Equol is a metabolite of the soya isoflavone daidzein by human intestinal bacteria. It resembles natural estrogens with an affinity to estrogen receptors. In humans, not everyone can produce equol. Since estrogen deficiency may be associated with LUTS, we evaluated the association between equol-producing status and LUTS in Japanese women.

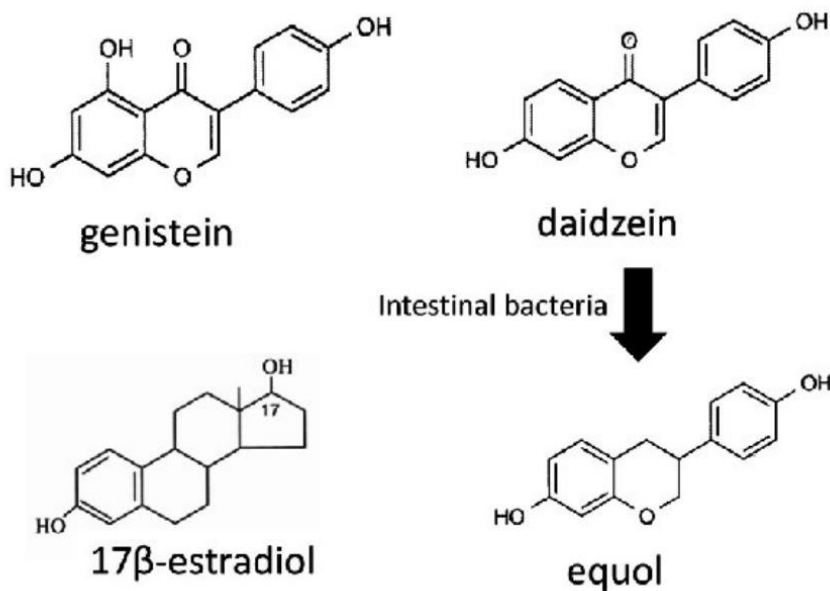
【Methods】 57 women who came to our hospital with various LUTS (Group L), and 55 women without LUTS who volunteered to participate (Group C) were examined for equol-producing status using urine sample.

【Results】 The percentage of women capable of producing equol in group L was significantly lower than that in group C : 24.6% vs group C; 45.5 % (p < 0.05)

【Conclusions】 Since the present study clearly showed that there were more equol producers in the group without LUTS than in the group with LUTS, there may be some association between female LUTS and the ability to produce equol. The impact of dietary phytoestrogens and their metabolites on female LUTS should be explored more.

Introduction

- Equol is a metabolite of the soya isoflavone daidzein that can be produced via the formation of the intermediate dihydrodaidzein by human intestinal bacteria.
- It resembles natural estrogens with an affinity to estrogen receptors.
- In humans, not everyone can produce equol from gut metabolism and approximately 30–40% of the adult population has the ability to perform this transformation.
- It is postulated that equol producers benefit more than non-equol producers for all the endocrine-related effects.
- Since postmenopausal estrogen deficiency causes atrophic changes in the lower urinary tract and may be associated with lower urinary tract symptoms (LUTS), we evaluated the association between equol-producing status and LUTS in Japanese women.



Methods and Materials

- Prospective cohort study
 - 57 Japanese women with LUTS who visited us (**Group L**) .
 - 55 Japanese women without LUTS who volunteered to participate (**Group C**) .
- Exclusion criteria
 - Age < 20, Age ≥ 75
 - Users of supplements containing Equol
- Definition of “LUTS” : Any of the following conditions.

OABSS: Urgency score of at least 2 and total score of at least 3

ICIQ-SF : total score of 4 or more

IPSS: total score of 8 or more

“without LUTS”: Do not recognize any of the above.
- The concentration of equol in urine was measured by high-performance liquid chromatography.
- Equol producers were classified as individuals having a level of equol in urine ≥ 1μM.

Results

- The diagnosed condition of women in group L were overactive bladder (n=18), stress urinary incontinence (n=22), mixed urinary incontinence (n=8), interstitial cystitis/bladder pain syndrome (n=9) and pelvic organ prolapse (n=16).
- Total scores of each questionnaire in group L were OABSS; 4 [0-12], ICIQ-SF; 8 [0-21] and IPSS; 13[5-24] (median [min-max]).
- The number of women capable of producing equol in group L was significantly lower than that in group C : group L;14 (24.6 %) vs group C; 25 (45.5 %), p = 0.0203

Table 1. Participant Characteristics

	Group L n=57	Group C n=55	P value
Age	57 (34-73)	56 (45-67)	0.816*
BMI(kg/m ²)	23.4 (17.3-34.9)	20.3 (17.3-29.1)	<0.0001*
postmenopausal woman	39 (68.4 %)	39 (70.9 %)	0.775**
parous woman	52 (91.2 %)	38 (69.1 %)	0.0032**

Table 2. Equol-Production Capability

	Group L n=57	Group C n=55	P value
Equol producer	14 (24.6 %)	25 (45.5 %)	0.0203**
Creatinine corrected Equal value (μmol/g cre)	0.38 (0-91.3)	0.68 (0-86.3)	0.0433*

* Wilcoxon rank sum test ** chi-square test

Table 3. Scores of Symptom Questionnaire

	Group L n=57	Group C n=55
OABSS	4 [0-12]	1 [0-4]
ICIQ-SF	8 [0-21]	0 [0-3]
IPSS	13 [5-34]	1 [0-5]

Discussion

- There are many reports suggesting an association between low female hormone levels and LUTS.
- No studies have examined the relationship between equol-producing status and LUTS.
- In the present study, the number of equol-producers in the LUTS group was significantly lower than that in the control group, suggesting that there may be some association between female lower urinary tract symptoms and the ability to produce equol.

<Limitations>

- Multiple factors are involved in LUTS, with ageing, obesity, childbirth, constipation, hypertension and diabetes etc. being risk factors.
- There were significant differences between the two groups in terms of delivery history and BMI.

Conclusions

- Small sample size and various conditions in LUTS group limited power to detect the specific association of equol with female LUTS.
- However, since the present study clearly showed that there were more equol producers in the group without LUTS than in the group with LUTS, the impact of dietary phytoestrogens and their metabolites on female LUTS should be explored more.

References

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