

황체호르몬 수용체의 발현이 저반응 환자군의 임신에 미치는 영향

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The effect of LH Receptor in the Pregnancy of Poor Responders

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Objectives: To investigate the effect of LH receptor in folliculogenesis, we confirm the expression level of LH receptor (LH-R) mRNA in human granulosa cells (GCs) and its expression levels were analyzed by comparison to embryo developmental rate and pregnancy rate.

Materials and Methods: GCs were obtained at the time of oocyte retrieval from the patients undergoing IVF-ET program. The patients were divided into two groups: Group I (n=20) is poor responder (retrieved oocyte(s) ≤3ea), Group II (n=80) is normal responder (retrieved oocytes>3ea). After the extraction of total RNA, semiquantitative RT-PCR was performed and the expression level of LH-R mRNA was normalized by β-actin. Statistical analysis was performed by using χ^2 test, Student's *t*-test and Pearson correlation.

Results: In Group II, the relative values of LH-R mRNA (0.680 vs. 0.463, $p<0.005$) and pregnancy rate (54.7% vs. 23.1%, $p<0.05$) were significantly higher than in Group I. Number of retrieved oocyte(s) was gradually increased when the expression of LH-R mRNA was increased ($p<0.05$). But the quality of retrieved oocyte and transferred embryo were not related with the expression of LH-R mRNA. When the pregnancy rate was compared with FSH only group and FSH combined with hMG group in the ovarian stimulation protocol, FSH combined with hMG group was significantly higher than FSH only group in Group I (37.5% vs. 0%), and the expression of LH-R mRNA was significantly higher in hMG combined group than FSH only group ($p<0.05$).

Conclusion: Expression level of LH-R mRNA has important role in ovarian function related with the response to gonadotrophin in human folliculogenesis. Furthermore these data might provide the

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evidence that additional use of hMG is helpful to poor responders.

Key Words: Folliculogenesis, LH-R, Poor responder, Pregnancy rate

FSH LH
 (theca cell) (granu-
 losa cell)가 (gonadotrophin;
 FSH and LH) ,
 (follicle stimulating hormone, FSH)
 (luteinizing hormone, LH)
 cell, two-gonadotrophin theory).¹⁻⁵
 (cho-
 lesterol) (androstenedion)
 , FSH aromatase
 (oestrogen)
 ,
 가
 .⁶ (in vitro fertili-
 zation) (controlled
 ovarian hyperstimulation, COH) FSH LH
 folliculogenesis (normal responder)
 (follicular stimulation protocol) (LH re-
 ceptor, LH-R)
 ,
 , 20%
 (inadequate oestro-
 gen response) 가
 (poor respon-
 der) ,
 ,⁷⁻⁹
 ,¹⁰⁻¹³
 가 ,
 (estro-
 gen peak)가 300 pg/ml
 8 10 mm 가 3 (100
 ,
 .¹⁴⁻¹⁷ > 3) 80 (8 10 mm
 가 8 10 mm
 3) 20
 . 2001 Placidi
 (recombinant) FSH 2. RNA
 (rFSH) (300 IU/day) rFSH
 (150 IU/day) hMG (150 IU/day) 7 15

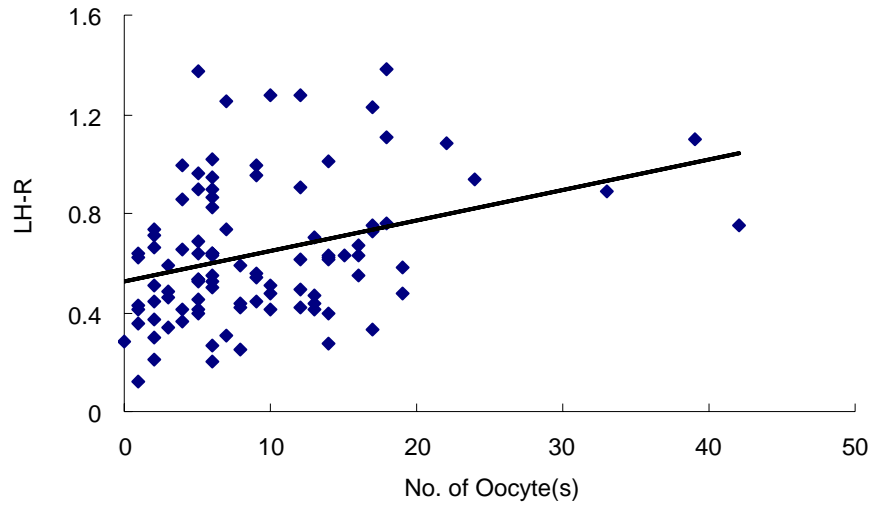


Figure 1. The relationship between expression level of LH-R and number of retrieved oocytes ($p < 0.05$).

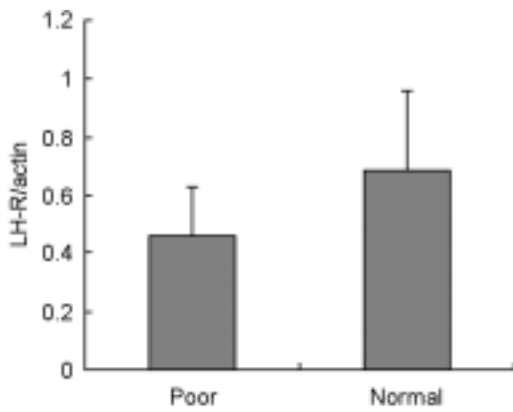


Figure 2. The expression level of LH-R mRNA in poor and normal responders ($p < 0.05$).

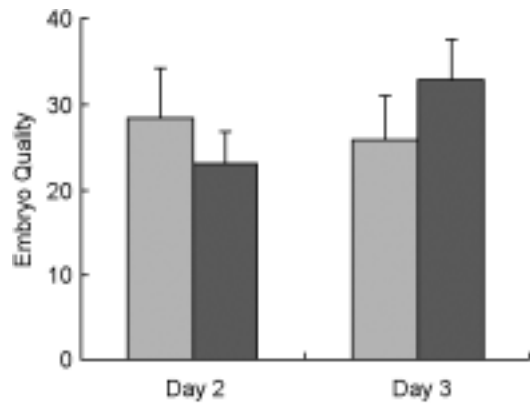


Figure 3. Developmental potency of cultured embryos in poor and normal responder groups ($p > 0.5$). (□, poor responder group; ■, normal responder group)

(28.333 vs. 22.893, $p = 0.63$), 3

(25.65 vs. 32.83, $p = 0.5$),

(Figure 3).

54.7% (41/75)

23.1% (3/13)

($p <$

0.05) (Figure 4).

3.

LH-R

(FSH

, FSH + hMG

FSH

FSH

) hMG

(Figure 5).

FSH

가 (0/5), FSH hMG

37.5% (3/8)

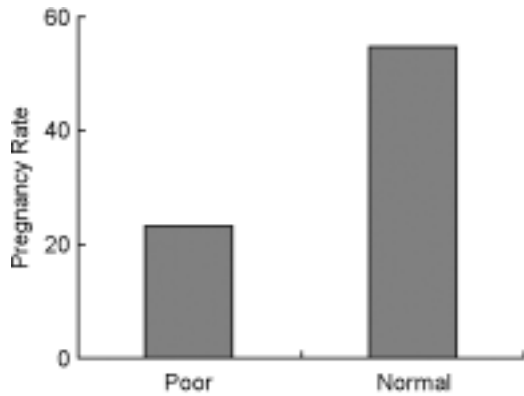


Figure 4. Pregnancy rates in poor and normal responder groups ($p < 0.05$).

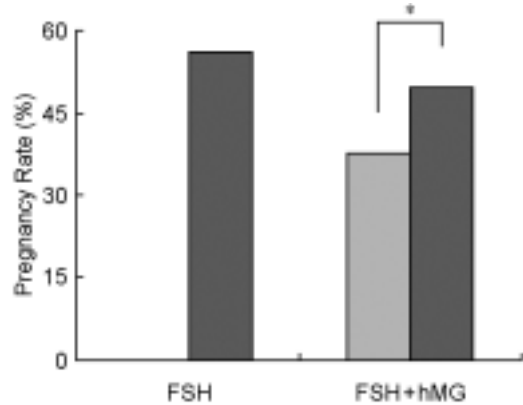


Figure 6. Pregnancy rates in poor and normal responders according to COH protocols including FSH alone or FSH combined with hMG injected groups (*, $p < 0.05$). (□, poor responder group; ■, normal responder group)

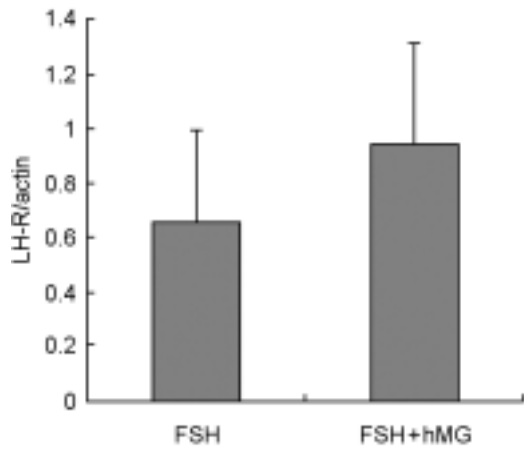


Figure 5. The expression level of LH-R mRNA according to COH protocols including FSH alone or FSH combined with hMG injected groups ($p < 0.05$).

Protocol	FSH	hMG	FSH+hMG
Pregnancy Rate (%)	56.1% (32/57)	50% (9/18)	56.1% (32/57)

(Figure 6).

가
FSH LH
20%
FSH
hMG
2001 Placido
FSH (hMG)
LH
LH folliculogenesis (androgen biosynthesis)
folliculogenesis FSH LH
FSH LH (aromatase acti-

vity) 가 ,

LH , , LH

LH-R 가

LH folliculogenesis가 , hMG

FSH 가

LH-R ,

LH

(1.75 vs. 11.09) (23.1% vs. 54.7%)

가

35% (7/20) (embryo transfer cancellation rate) (3/80) 3.8%

가

(25.65 vs. 32.83)

LH-R

FSH

FSH hMG

LH-R

FSH

FSH hMG

(56.1% vs. 50%)

FSH

(0/5) , 37.5%

FSH hMG (3/8)

FSH-R, IGF-I, IGF-2, IGF-1R

- LH-R 가
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