

# 항남성호르몬요법의 최신지견

## Current Concepts in Androgen Deprivation Therapy

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Jeong Hee Hong, M.D. · Han Yong Choi, M.D.

Department of Urology

Sungkyunkwan University School of Medicine

Samsung Seoul Medical Center

E-mail : hjh178@freechal.com · hychoi@smc.samsung.co.kr

### Abstract

The hormonal sensitivity of prostate cancer has been exploited clinically since Huggins and Hodges established the suppressive effects of castration on prostate cancer. Despite over sixty years of research into alternate modalities, androgen deprivation therapy (ADT) has become the mainstay treatment for locally advanced and metastatic prostate cancer. Suppression of testosterone production, the primary goal of hormonal therapy, can be achieved by a multitude of treatments. The ideal timing, duration and composition of ADT remains undefined. At the present time, first-line therapy consists of orchiectomy, luteinizing hormone-releasing hormone (LHRH) analogues or complete androgen blockade (CAB). However, new combinations and treatment settings show promise for improving outcomes and decreasing toxicity. This article provides an overview of the hormonal therapies currently used in advanced prostate cancer.

**Keywords :** Prostate cancer; Castration; Androgen antagonists

19<sup>41</sup> Huggins Hodges가  
(phosphatase)

Leydig

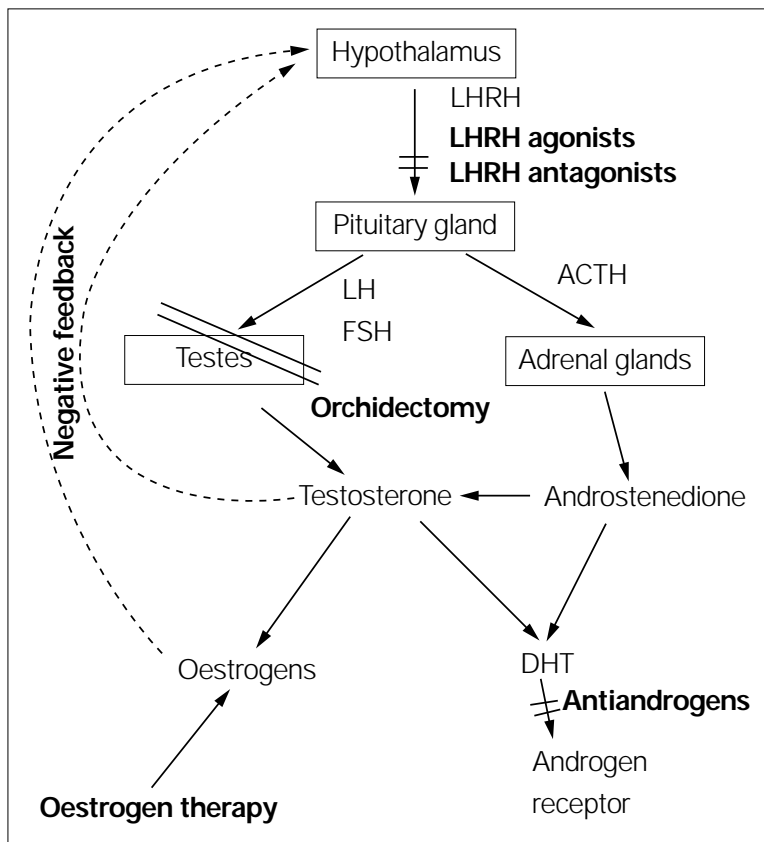
(luteinizing hor-

mone-releasing hormone, LHRH)

(testosterone)

40%

(2%)



LHRH : luteinising hormone - releasing hormone, LH : luteinising hormone, FSH : follicle - stimulating hormone, ACTH : adrenocorticotrophic hormone, DHT : dihydrotestosterone

1. Update Series 2003 ; 1 : 32 - 9)

(J. Anderson. from EAU

1. (Surgical Castration)

5 ~ 10% 가

, Huggins

71% (15/21)

acid phosphatase

5 - (5 - - reductase)  
(dihydrotestosterone)

(0.2 ng/ml)

가

(lean body mass)

(fat body mass) 가, , 2) LHRH (LHRH Antagonists)  
 (triglyceride) 가 . LHRH LHRH .  
 . 1 LHRH 가  
 2. (Medical Castration) 24  
 . 2 LHRH (Abiraterone, Enzalutamide, Relugolix, Goserelin, Abiraterone, Enzalutamide, Relugolix)가  
 1) LHRH (LHRH Analogues) 가 .  
 LHRH (leuprolide acetate, goserelin, buserelin acetate, nafarelin acetate, triptorelin pamoate ) 1970 , 3) (Antiandrogens)  
 LHRH (1) (Nonsteroidal Antiandrogens)  
 (negative feedback)  
 가 .  
 3~4 .  
 90%(<0.5 ng/ml) 가 .  
 2~3 (luteinizing hormone, LH) 가 가 LHRH  
 33% , ,  
 (prostate specific antigen, PSA) 가 가 .  
 (flare phenomenon) .  
 LHRH (estradiol) 가 .  
 1 3~4 .  
 . LHRH Flutamide

2 - hydroxyflutamide 3 ~ 4  
 5 ~ 6 250 mg 30 ~ 40  
 (21%), (40%), (41%), 50 mg 100 mg  
 (3%), (86%)  
 가 ,  
 , ,  
 Nilutamide  
 Flutamide 가 Megestrol Acetate  
 2 Cyproterone acetate 가  
 56 150 mg 가  
 , , , ,  
 , ,  
 Bicalutamide 4)  
 Flutamide 5 ~ 10 (Adrenal Androgen Inhibitors)  
 50 mg 10%  
 , ,  
 prothrombin (1) Ketoconazole  
 time Imidazole  
 (2) (cortisol) 48  
 (Steroidal Antiandrogens) 가  
 Cyproterone Acetate (disseminated  
 (progesterone) 가 intravascular coagulation, DIC)  
 200 mg  
 400 mg (adrenal in-  
 sufficiency) hy-  
 drocortisone , ,  
 가 , ,  
 (2) Aminoglutethimide  
 Ketoconazole cytochrome P - 450  
 (hydroxylation)

1.

Study	Eligibility	Intervention	Results
ECOG	Node positive	Prostatectomy demonstrating node positivity, then randomized to goserelin or orchiectomy vs. observation	Immediate ADT was associated with improved OS, PFS and DFS. After 10 years, the survival of patients treated with ADT was 80% compared to 55% in patients treated with deferred ADT.
EORTC	T1/T2 high - grade, T3/T4 any grade, node negative	Definitive XRT vs. XRT + goserelin beginning day 1 × 3 years	Improvement in 5 yr OS and DFS with the addition of ADT.
RTOG 85 - 31	Clinical stage T3 or node positive	Definitive XRT or salvage XRT alone vs. XRT with goserelin beginning the last week of XRT	Improvement in local control, freedom from distant metastasis and DFS with the addition of ADT. No benefit in OS at 8 years except in patients with high grade cancers.

ADT : androgen deprivation therapy, OS : overall survival, PFS : progression - free survival, DFS : disease - free survival, XRT : radiation therapy

, , , , , (40%), , , , ,

(3) Corticosteroid  
ACTH

가 가

5) (Estrogenic Compounds) (2) polyestradiol phosphate  
LHRH

가

(1) Diethylstilbesterol(DES)  
LHRH 가

6) 5 -  
(5 - - Reductase Inhibitor)  
(1) Finasteride

2 5 -

75%



2.	
Trial Characteristics	No. Trials
Overall	27(7,987 pts)
Castration method	
LHRH analogue vs. LHRH analogue + antiandrogen *	13
Orchiectomy *	14
vs. orchiectomy + antiandrogen	11
vs. LHRH analogue + antiandrogen	3
LHRH analogue or orchiectomy vs.	1
LHRH analogue or orchiectomy + antiandrogen	
Antiandrogen type	
Nonsteroidal	20
Flutamide	12
Nilutamide	8
Cyproterone acetate	7
Trial size (No. randomized pts./arm)	
Greater than 100	16
Less than 100	11
Complete androgen blockade vs. monotherapy results	27
Complete androgen blockade positive effect	3
No statistical difference	24
* The trial of de Voogt et al with a 3 - arm design is counted in 2 categories	

1.	
(Complete Androgen Blockade)	Scher Kelly
	flutamide
	40%
	5
	(antian-
	drogen withdrawal syndrome)
가	3~5
	1

가

가

가

2. (Intermittent Androgen Blockade or Deprivation)

3. (Triple Androgen Blockade)

12

finasteride

(apop-

tosis)

가

4. (Sequential Androgen Blockade)

finasteride

가

3

2

PSA

가

3

(55 ~ 82%)

1986 Klotz 20

10

5. Bicalutamide

(High - dose Bicalutamide)

150 mg bicalutamide

lutamide

(M1)

150 mg bica-

가

(M0)

2 (phase trials)

(42%), (62%)

(69%),

가(75%),

6~



## PSA

가

. Modi 1

50%

, Smith

leuprolide

, bisphosphonate

pamidronate

bisphosphonate가

가

가

zoledronic acid 가

LHRH

가

가

가

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