

Expression of androgen receptor in breast cancer brain metastasis

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INTRODUCTION

- Treatment options for women with breast cancer brain metastases (BrM) are generally limited to surgery and/or radiotherapy
- Most systemic therapies do not cross the blood-brain barrier.
- Androgen receptors (ARs) are frequently expressed in breast cancer
- Anti-androgenic therapies have been shown to penetrate the central nervous system.
- **In this study, we analyzed the expression of AR in breast cancer BrM to identify patients who may benefit from anti-androgenic therapies.**

OBJECTIVES

1. To identify molecular subtype of brain metastases of breast origin
2. To determine the expression of AR across different subtypes of breast cancer brain metastases

METHODS

- Consecutive BrM of breast origin resected in our institution (July 1999-June 2013) were identified from the Anatomic Pathology departmental database.
- A tissue microarray was constructed using 1 mm cores in triplicates and studied by immunohistochemistry:
 - AR, ER, PR and HER2 (SP107, SP1, IE2, 4B5; Ventana Medical Systems, Tucson AZ, USA).
 - HER2 gene amplification was determined by INFORM HER2 DNA and Chromosome 17 (Ventana Medical Systems, Tucson AZ, USA).

RESULTS

Distribution of AR amongst different subtypes of breast cancer brain metastases.

	Samples	AR+	%AR+
Luminal A	2	1	50.0
Luminal B (HER2+)	15	15	100.0
Luminal B (HER2-)	16	8	50.0
Her2+	14	10	71.4
Triple Negative	14	4	28.6
TOTAL	61	38	62.3

AR+ was defined as $\geq 1\%$ AR staining.

Subtypes are defined as follows: Luminal A: ER+, PR+/-, HER2-, Ki67<16%; Luminal B: ER+, PR+/- ; and triple negative (TN): ER-, PR-, HER2-.

- Two-thirds of breast cancer BrM express AR.
- Brain metastases of HER2+ luminal B and HER2+ subtypes were most likely to be AR+.
- Triple negative (TN) brain metastases had the lowest number of AR+ samples (~30%).

- Our data suggests that certain subtypes of breast cancer brain metastases are more likely to be AR+, which may serve as a **potential therapeutic target**.
- Further studies need to evaluate the expression of AR in larger sets of breast cancer BrM samples.
- In addition, the expression of AR in paired breast cancer and corresponding brain metastases samples would allow for determining any discordance patterns in AR expression.