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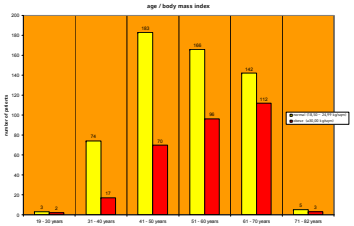
Tumor characteristics and prognostic factors in nodal positive early stage breast cancer of obese patients – Sub analysis of the German ADEBAR study

Background

Obesity is often associated with an increased risk of dying from breast cancer and poor outcomes of therapy. There are several possible explanations for this phenomenon.

The aim of this analysis was to examine the correlation and potential causality between overweight, obesity and breast cancer. Tumor size, tumor histology, tumor grading and tumor localisation, number of positive lymph nodes, patients age, menopausal status, hormone receptor and HER-2 status are relevant characteristics in prognosis and treatment of breast cancer and at the same time potentially strongly associated with the body mass index.



tumor localisation

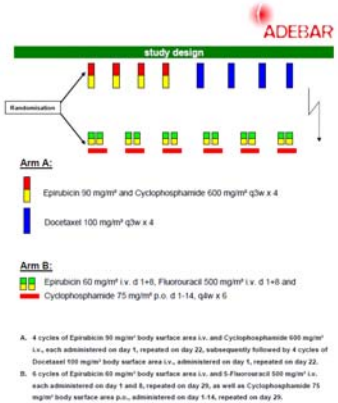
	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
unilateral right	276	48,2	153	51
unilateral left	293	51,1	49	440
bilateral	4	0,7		

tumor size

	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
< 2cm	188	32,8	61	20,3
> 2cm < 5cm	301	52,5	184	61,3
> 5cm	45	7,9	47	15,7
unknown	39	6,8	8	2,7

positive lymph nodes

	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
≤ 5	178	31,1	74	24,7
6 - 10	220	38,4	107	35,7
11 - 15	87	15,2	62	20,7
16 - 20	49	8,6	28	9,3
≥ 21	36	6,3	29	9,7
unknown	3	0,5		



Patients and Methods

The ADEBAR study is a german multicenter phase III trial (n=1502). Study-goal was to evaluate whether breast cancer (BC) pts with > 3 axillary lymph node metastases benefit from a sequential anthracycline-docetaxel regimen (E90C–D: 4 cycles epirubicin [E] 90 mg/m² plus cyclophosphamide [C] 600 mg/m² q21 days followed by 4 cycles docetaxel [D] 100mg/m² q21 days) compared to dose-intensive anthracycline-containing poly-chemotherapy (FE120C: 6 cycles E 60 mg/m² d 1+8, 5-FU 500mg/m² d 1+8 and C 75 mg/m² d 1-14, q4 weeks).

For our evaluation at hand Adebar-Patients were grouped according the WHO global database on body mass index (BMI) into normal range (18,50 – 24,99 kg/sqm) and obese (≥30,00 kg/sqm) high risk patients.

Results

There is a strong correlation between body mass index, age and menopausal status at clinical diagnosis of breast cancer. Obese patients (n=300) at diagnosis in median are 55 years old (range 27-71 year) and already postmenopausal (52%, n=209).

This analysis shows no connection of tumor localisation (unilateral left or right and bilateral breast cancer) and BMI.

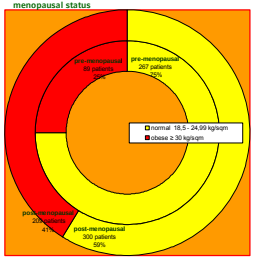
The tumor size at clinical diagnosis was strongly associated to the patient's weight (<0.0001). Breast tumors in obese patients have shown a size >3cm in 61 % (n=184) and a size >5cm in 16% (n=47).

In normal weight and obese patients there was no sign for a significant difference in the number of positive lymph nodes (p=0.0440), tumor histology (p=0.8028) and grading (p=0.7353). Breast Cancer positivity for ER and PR hormone receptors (ER p=0.7364, PR p=0.4405) and the expression of HER-2 at the tumor surface (p=0.1560) were not significant associated to obesity in study patients.

histology

	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
lobular invasiv	127	22,2	61	20,3
ductal invasiv	393	68,6	212	70,7
other	47	8,2	24	8

menopausal status



Her2 receptor

	normal 18,5 - 24,99 kg/sqm	obese ≥ 30 kg/sqm
	number	number
positive	365	179
negative	188	114
missing	20	7

ER receptor

	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
positive	406	70,9	213	71
negative	159	27,7	79	26,3
missing	8	1,4	8	2,7

PR receptor

	normal 18,5 - 24,99 kg/sqm		obese ≥ 30 kg/sqm	
	number	%	number	%
positive	363	63,4	196	65,3
negative	204	35,6	98	32,7
missing	6	1	6	2

Conclusion

Our sub analysis between normal weight and obese patients shows a highly significant coherence between body mass index and tumor size in patients with early stage node positive breast cancer.

This finding is in line with current publications which show that overweight and obese woman have often been diagnosed at a more advanced stage of disease and the treatment in this patients being less effective as a consequence. Weight reduction and tumor prevention in this high risk collective might be an additional approach on breast cancer therapy.

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