Economic impact of Oncotype DX® result guided adjuvant treatment decision making in estrogen receptor-positive early breast cancer in Hungarian healthcare system

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AIMS

Role of hormonal therapy (HT) is well established in node negative (N0) estrogen-receptor-positive (ER+) early breast cancer (EBC). However benefit of chemotherapy (CT) in patients with N0, ER+ EBC is limited to a relatively small proportion of patients. Oncotype DX® provides additional predictive and prognostic information beyond traditional clinical and pathological criteria. International guidelines (NCCN [1], ASCO [2], ESMO [3] and StGallen Guideline [4]) include Oncotype DX® test to evaluate risk of recurrence and predict the benefit of CT in ER+ EBC. NICE draft consultation document [5] also recommends the use and reimbursement of Oncotype DX® for selected patients (Intermediate risk based on Nottingham Prognostic Index or Adjuvant Online!). We assessed the cost-effectiveness of Oncotype DX® when added to clinical practice using traditional clinical and pathological criteria, in a small group of patients with ER+ EBC.

METHODS

Fifteen Oncotype DX® tests were performed in selected ER+ EBC patients. Eligibility criteria for testing were T1c, T2, N0, N1mi, ER expression min. 50% and HER2 negative EBC. In addition 2 of the following criteria were allowed: Grade III, Ki67>15%, LVI+, age<40y. Patients with clear treatment preferences were excluded. Information about adjuvant treatment plan was collected before and after obtaining Oncotype DX® Recurrence Score. There was an agreement that in case of the Recurrence Score (RS) is below 25, HT will be the choice of therapy and in case of the RS is equal to, or higher than 25 both CT +HT therapy will be administered.

Characteristics	n =
T1C	11 / 15
T2	4/15
N0	10/15
N1mi	5/15
ER+	15/15
HER2-	15/15 (14/15)
Grade III	4/15
LVI+	5/15
<40y	3/15
15% < Ki67	5/15

Table 1: Patient Characteristics

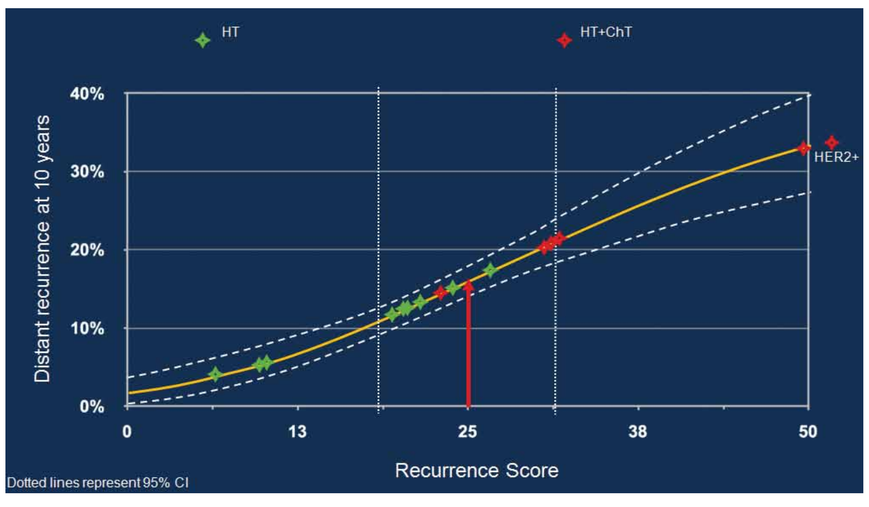

Figure 1: Distribution of Recurrence Score results

The cost effectiveness of using the Oncotype DX® test in the Hungarian clinical practice was modeled from the perspective of the healthcare payer. The model described in previous publication (Holt et al, SABCS 2011) was adapted to the Hungarian setting. The model structure is described in Figure 2.

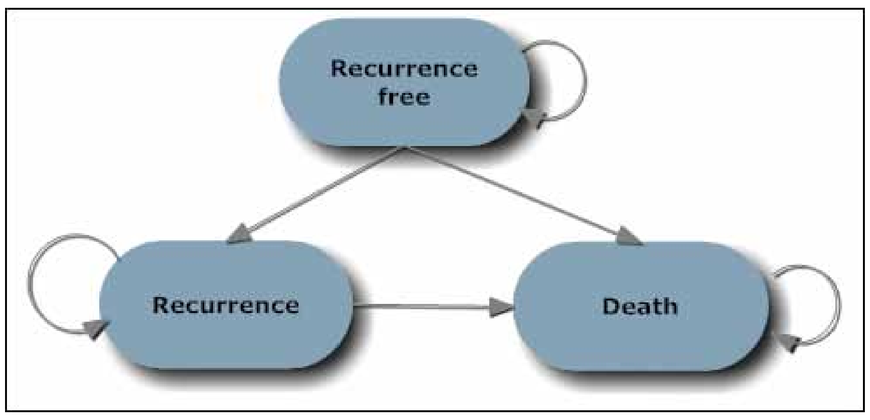

Figure 2: Model structure

The model was populated with data coming from Hungarian sources (decision impact, cost and mean age of breast cancer population), landmark clinical trials (clinical parameters such as the risk of recurrence and relative risk reduction per Recurrence Score group) and international publications (utility data). Model parameters are described in Table 2.

Demographic input			Source
Average age	51,4 year		Calculated from real life data
Median age	50,1 year		
Range	35,2-65,3 year		

Probability of adjuvant treatment without Oncotype DX®	Endocrine treatment	Chemoendocrine treatment	Source
Low:	0,0%	21,4%	Calculated from real life data
Intermediate:	0,0%	64,3%	
High:	0,0%	14,3%	

Net change in CT use following Oncotype DX® testing (proportion of total)		
Low:	-21,43%	Calculated from real life data
Intermediate:	-42,86%	
High:	0,0%	

Ten year risk of recurrence	Endocrine treatment		Source
Low:	3,2%		6
Intermediate:	9,1%		
High:	39,5%		

Annual risk of recurrence	Endocrine treatment	Chemoendocrine treatment	Source
Low:	0,32%	0,32%	Calculated value from the 10 year recurrence data adjusted by RRR.
Intermediate:	0,95%	0,95%	
High:	4,90%	1,08%	

Relative Risk Reduction (RRR) of relapse with use of CT		Source
Low:	0,0%	6
Intermediate:	0,0%	
High:	74%	

Table 2. Model parameters

Annual risk of recurrence	Endocrine treatment	Source
Disutility associated with CT	0,07 QALYs	7
One year recurrence free	0,75 QALYs	8
One year post recurrence	0,60 QALYs	9
Survival post recurrence	3,30 years	10

Table 3. Utility data

	Adverse events	Treatment	Comments and sources
Cost of HT:	13,27 €	505,48 €	(annual cost: years 1-5) based on 11
Cost of CHT:	765,13 €	3 545,90 €	(treatment term) based on 11
Cost of distant recurrence:		1 109,91 €	(monthly) based on 11
Cost of Oncotype DX®		3 100,00 €	Calculated from US list price (4 290 USD)

Table 4. Cost data

RESULTS

Among women with EBC use of the Oncotype DX® test changed treatment recommendations (from HT+CT to HT alone) in 64% of cases (9/14). Reimbursement criteria allow the use of the assay only in patients for whom there is a doubt about the value of chemotherapy. We found 1 patient HER2+ by both Oncotype DX® RT-PCR and IHC testing. This patient (found HER2- in local lab) was excluded from final evaluation.

The net cost difference per patient is 329 €, while the net QALYs (quality adjusted life year) gain is 0.04 QALY. Based on these differences the incremental cost effectiveness ratio is 7 347.29 € / QALY which is well under the cost effectiveness threshold in Hungary (27 000 €) and represents a good use of the Hungarian healthcare resources.

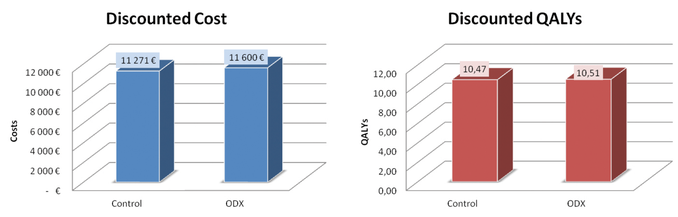

Figure 3-4 Results

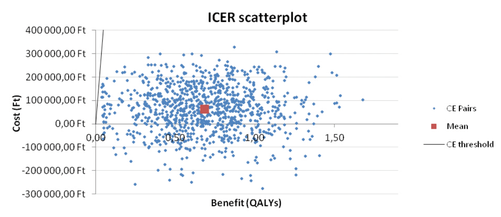

Figure 5. Sensitivity analysis

CONCLUSION

There was a wide range of Recurrence Score results in these tumors (11-49). Although based on a small patient series these data show that using Oncotype DX® is cost effective in patients with ER+, HER2-, early breast cancer patients in Hungary. Based on International guidelines recommendations [1,2,3,4], highest level of evidence (1B[12]) among genomic tests and local cost effectiveness data Oncotype DX® has been submitted for reimbursement in Hungary for selected patient population.

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