

TIME INTERVAL FROM DIAGNOSIS TO TREATMENT: THE DEFINITION OF DIAGNOSTIC DATE STRONGLY INFLUENCES THERAPEUTIC DELAY

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INTRODUCTION

Delays between diagnosis and treatment onset adversely affect important numbers of patients. The analysis, monitoring and control of the magnitude and characteristics of delays in cancer treatment remain important, and it is not simple to study. Data collected by hospital tumor registries may provide a wealth of information potentially valuable for the improvement of the quality of care of cancer patients. However, these data are often heterogeneous across registries.

OBJECTIVES

To analyze the magnitude of differences in the time interval between diagnosis and treatment onset (therapeutic delay) in patients with cancer, according to diagnostic date (clinical diagnosis or certainty diagnosis), and by tumor site, tumor stage, mode of hospital admission, and calendar period.

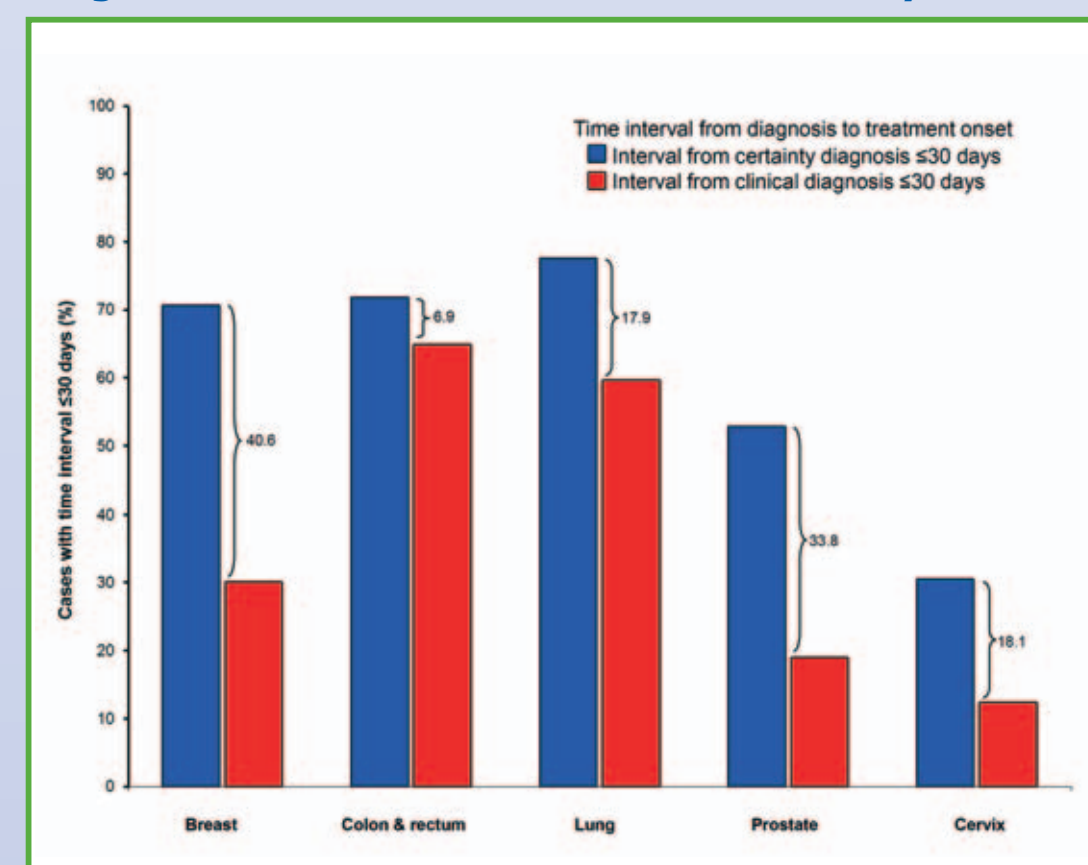
MATERIALS AND METHODS

From Hospital del Mar (Barcelona) tumor registry we selected all 8,814 patients with breast, colorectal, lung, prostate or cervical cancer diagnosed between 1992 and 2006. We compared the interval from clinical diagnosis to treatment onset (IClinDT) and the interval from certainty diagnosis (anatomopathological) to treatment onset (ICertDT) with density plots and logistic regression.

RESULTS

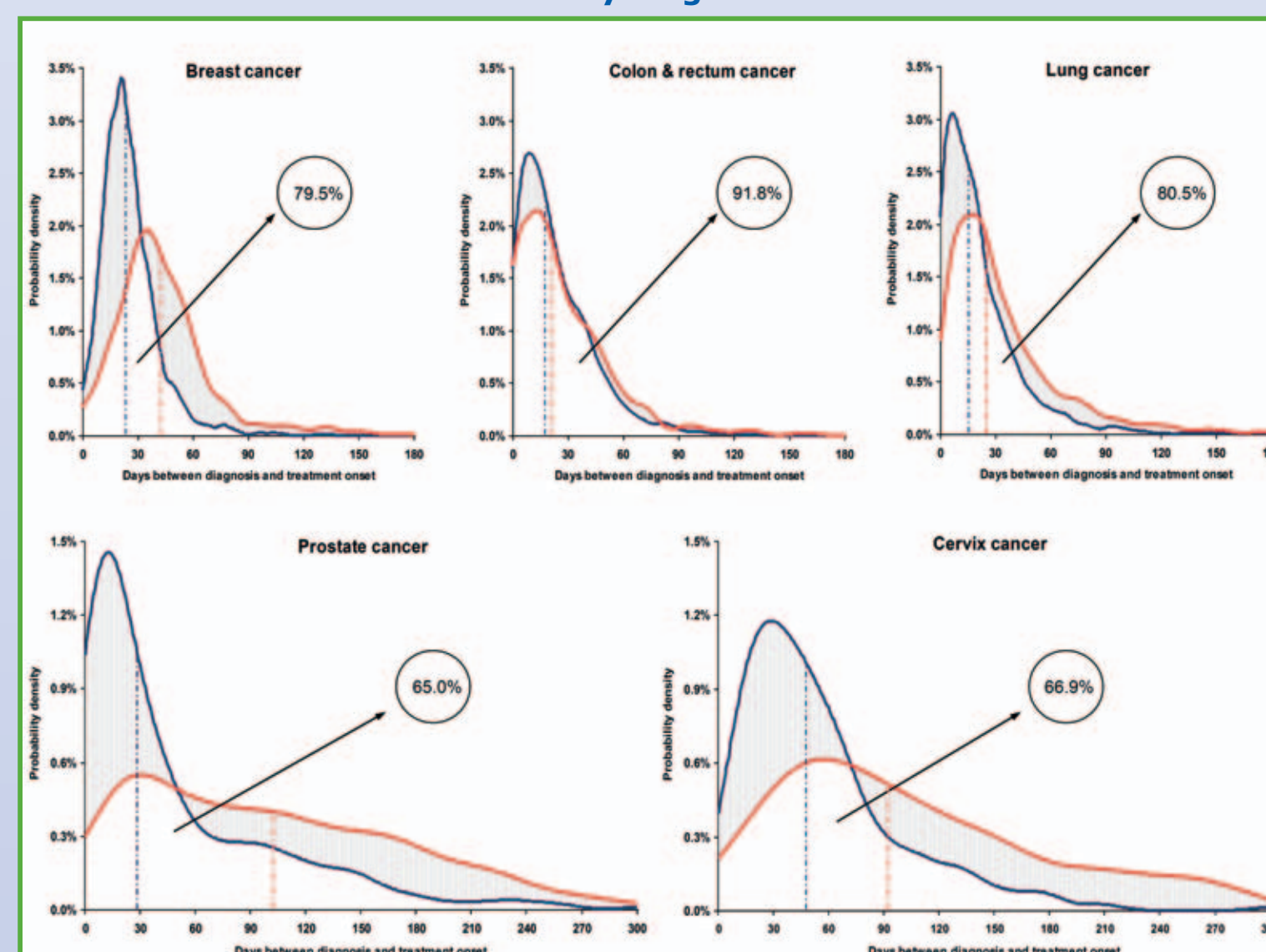
IClinDT was up to three times higher than ICertDT. In breast cancer, 30% and 71% of patients started treatment ≤ 30 days after clinical and certainty diagnosis, respectively (Table 1, Figure 1 and 2). Tumor stage significantly influenced the difference between the two intervals in four of the five locations (Table 2). In breast and prostate cancer, as stage worsened, the difference between IClinDT and ICertDT became smaller (p-trend < 0.001). In all tumor sites, the difference between the two intervals was larger in scheduled than in emergency admissions.

FIGURE 1. Percent of patients with an interval between diagnosis and treatment onset less ≤ 30 days.



Note: Blue bars indicate the percentage of cases with a time interval between the certainty diagnosis and treatment onset ≤ 30 days. Red bars indicate the percentage of cases with a time interval between the clinical diagnosis and treatment onset ≤ 30 days. The number between two bars indicates the difference in the percentage of cases with time intervals ≤ 30 days.

FIGURE 2. Distribution of the time intervals from clinical diagnosis to treatment onset and from certainty diagnosis to treatment onset.



Note: Blue broken lines indicate the median days of the time interval from certainty diagnosis to treatment onset, and red broken lines indicate the median days of the time interval from clinical diagnosis to treatment onset. The percentages are the common area of the two distributions (white area).

TABLE 1. Time intervals from diagnosis to treatment onset in different locations of cancer according to clinical and certainty diagnosis.

	Tumoral site				
	Breast	Colon & rectum	Lung	Prostate	Cervix
Total number of cases	2147	1873	2024	669	510
Time interval from clinical diagnosis to treatment onset (IClinDT) (days)					
Number of cases (%)	1402 (65.3)	1070 (57.1)	1213 (59.9)	448 (67.0)	388 (76.1)
Median (interquartile range)	42 (28)	21 (29)	25 (31)	102 (131)	92 (105)
Percent of cases with time interval ≤ 30 days	30.1	64.9	59.7	19.0	12.4
Time interval from certainty diagnosis to treatment onset (ICertDT) (days)					
Number of cases (%)	1658 (77.2)	1069 (57.1)	1564 (77.3)	458 (68.5)	321 (62.9)
Median (interquartile range)	23 (17)	17 (26)	15 (22)	28 (65)	47 (49)
Percent of cases with time interval ≤ 30 days	70.7	71.8	77.6	52.8	30.5
Difference of medians² (days)	19	4	10	74	45
p value³	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Difference in percentage of cases with time intervals ≤ 30 days²	40.6	6.9	17.9	33.8	18.1
p value⁴	< 0.001	0.001	< 0.001	< 0.001	< 0.001

¹ Number of cases excluding those with non-applicable time intervals: date of diagnosis or treatment onset unknown, or invalid time interval (see Methods).
² Within each tumor site.
³ Mann-Whitney U test (two-tail).
⁴ Fisher's exact test (two-tail).

TABLE 2. Time intervals from diagnosis to treatment onset regarding tumor stage according to clinical and certainty diagnosis. Breast and colorectal cancer.

	Tumor stage						Maximum difference ²
	0	I	II	III	IV	Unknown	
Breast cancer							
Interval clinical diagnosis-treatment onset (days)							
Number of cases (%)	150 (10.7)	505 (36.0)	458 (32.7)	155 (11.0)	60 (4.3)	74 (5.3)	
Median (interquartile range)	55 (30.5)	44 (25.5)	38 (25.3)	36 (31.0)	25 (23.5)	-	$< 0.001^3$
Percent of cases with interval ≤ 30 days	14.0	22.6	34.7	37.4	63.3	-	$< 0.001^4$ 49.3
Interval certainty diagnosis-treatment onset (days)							
Number of cases (%)	129 (7.8)	523 (31.5)	571 (34.4)	214 (12.9)	97 (5.9)	124 (7.5)	
Median (interquartile range)	26 (16.5)	23 (15.0)	23 (17.0)	25 (19.3)	18 (19.5)	-	$< 0.001^5$
Percent of cases with interval ≤ 30 days	67.4	74.6	71.3	65.0	81.4	-	0.012 ¹ 16.4
Difference in percentage of cases with time intervals ≤ 30 days	53.4	52.0	36.6	27.6	18.1	-	
p value¹	< 0.001	< 0.001	< 0.001	< 0.001	0.014	-	
Colon & rectum cancer							
Interval clinical diagnosis-treatment onset (days)							
Number of cases (%)	-	172 (16.1)	308 (28.8)	277 (25.9)	188 (17.5)	125 (11.7)	
Median (interquartile range)	-	29 (37.8)	22 (30.0)	24 (28.0)	19 (24.0)	-	0.001 ⁵
Percent of cases with interval ≤ 30 days	-	52.9	65.9	59.2	71.8	-	0.001 ¹ 18.9
Interval certainty diagnosis-treatment onset (days)							
Number of cases (%)	-	135 (12.6)	293 (27.4)	261 (24.4)	240 (22.5)	140 (13.1)	
Median (interquartile range)	-	27 (26.0)	17 (27.0)	21 (26.0)	14 (18.0)	-	$< 0.001^5$
Percent of cases with interval ≤ 30 days	-	60.7	70.3	66.7	83.3	-	$< 0.001^1$ 22.6
Difference in percentage of cases with time intervals ≤ 30 days	-	7.8	4.4	7.5	11.5	-	
p value¹	-	0.202	0.256	0.075	0.005	-	

¹ Fisher's exact test (two-tail).
² Maximum difference in percent points between the percentages of cases with time interval ≤ 30 days in each tumor stage.
³ Jonckheere-Terpstra test for linear trend. ⁴ Mantel-Haenszel's χ^2 test for linear trend. ⁵ Kruskal-Wallis test.

DISCUSSION AND CONCLUSIONS

The choice of diagnostic date strongly affected treatment delay, which varied highly by tumor site, stage and mode of hospital admission. Standardized and valid procedures to calculate time intervals until diagnosis and treatment onset are still needed.