

Trends in prognostic factors and treatment of invasive cervical cancer patients over a 16-year-period (1998-2013): a population-based analysis

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Tumorregister München (TRM)

Introduction

The objective was to identify trends in treatment and outcome of invasive cervical cancer in a population-based setting.

Methods

The Munich Cancer Registry (MCR) is the population based clinical cancer registry of Upper Bavaria and a part of Lower Bavaria (Southern Germany).

Its catchment area has increased from 2.3 million inhabitants to 3.8 million in 2002 and to 4.6 million in 2007 (meanwhile 4.7 million).

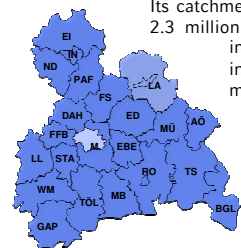


Fig. 1: Catchment area of the Munich Cancer Registry (MCR)

3,246 patients with invasive cervical cancer diagnosed between 1998 and 2013 in the catchment area of the Munich Cancer Registry (MCR) were analysed. Trends in prognostic factors and treatment were examined by comparing patients diagnosed within the years 1998-2008 (n=2,108) and 2009-2013 (n=1,138).

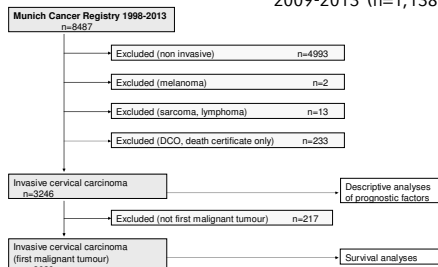


Fig 2.: Flow chart of cervical cancer patients

Results

Prognostic factors

The median age at diagnosis of 50.0 years (p=0.918) and grading with 46.5% G3-tumours (p=0.396) did not change significantly over time.

Table 1: Patients' and tumour characteristics

	1998-2008 n=2108	2009-2013 n=1138	Total n=3246	p
Age				
Mean / Median	52.9 / 49.6	52.9 / 50.5	52.9 / 50.0	0.918
<40	506	246	752	23.2
40-49	567	306	873	26.9
50-59	382	234	616	19.0
60-69	291	138	429	14.2
≥70	362	183	545	16.8
Lymph node involvement				
N0	896	481	1377	64.8
N+	441	330	771	35.2
Missing	771	351	1122	34.6
Grading				
G1	115	79	194	6.6
G2	887	496	1383	47.0
G3/4	878	491	1369	46.5
G3/4 Missing / GX	228	72	300	9.2
pTcT				
1A	363	205	568	19.2
1B	745	382	1127	38.1
2A	77	45	122	4.1
2B	291	155	446	15.5
3	161	86	247	8.1
4	72	38	110	3.7
M1	173	92	265	11.3
Missing	226	60	286	8.8

Treatment

Treatment approaches did not alter (p=0.951), with 7.1% of the patients having conisation, 64.9% treated by surgery, 21.9% having radiochemotherapy alone. In lymph node surgery there was a slight increase in the use of sentinel lymph node biopsy from 2.4 to 10.1% (p<0.001). For patients with lymph node dissection the median number of examined lymph nodes increased from 28 to 33 (p<0.001).

Table 2: Treatment options based on time of diagnosis

	1998-2008 n=2108	2009-2013 n=1138	Total n=3246	p
Therapy				
Conisation	142	78	220	7.1
Surgery	821	430	1251	40.4
Surgery+radiotherapy	495	263	758	24.5
Radiotherapy	442	237	679	21.9
Others	119	71	190	6.1
Missing	89	59	148	4.6
Surgery				
Residual tumour				
R0	840	594	1434	88.1
R1	140	54	194	11.9
Missing	336	45	381	19.0
Sentinel surgery				
yes	32	70	102	5.1
thereof positive	4	10	14	13.7
LN surgery (incl. sentinel)				
yes	965	547	1512	75.3
no	351	146	497	24.7
Type of LN surgery (incl. sentinel)				
sentinel alone	6	32	38	1.9
pelvic	451	194	645	32.1
pelvic+para-aort.	271	268	539	26.8
LND nos.	237	53	290	14.4
no LN surgery	351	146	497	24.7
LND (without SLNB)				
dissected LNs				
Mean / Median	30.4 / 28.0	34.8 / 33.0	32.0 / 30.0	<0.001
1 - 24	333	141	474	33.9
> 24	558	366	924	66.1
Missing	68	8	76	5.2
positive LNs				
0	649	361	1010	72.3
1 - 2	123	80	203	14.5
> 2	119	66	185	13.2
Missing	68	8	76	5.2

LND: Lymph node dissection SLNB: Sentinel lymph node biopsy LNs: Lymph nodes

In surgery of the primary tumour, the percentage of patients with no residual tumour (R0) increased from 85.7% to 91.7% (p<0.001), and was 98.5% in pTcT1a and 97.6% in pTcT1b patients diagnosed 2009-2013 (not shown).

Table 3: Treatment based on pT/cT stage

	1998-2008 n=2108	2009-2013 n=1138
pTN/cTN M		
Coni* Surg*		
Coni*		
1A N0 M0	110	44
1A N+ M0	2	1
1A NX M0	251	160
1B N0 M0	558	293
1B N+ M0	111	57
1B NX M0	76	32
2A N0 M0	36	23
2A N+ M0	34	18
2B N0 M0	118	78
2B N+ M0	120	78
3 N0 M0	26	26
3 N+ M0	48	27
2-3 NX M0	147	41
4 N0 M0	72	38
M1	173	162
TX / Missing	226	60
Total	1882	1078
%	7.0	7.1
%	41.8	39.6
%	25.3	24.1
%	18.9	20.4

*Coni: Conisation
Surg: Surgery, includes trachelectomy, hysterectomy, wertheim surg. and exenteration
R/CIT: Radio(chemo)therapy
Patients with other treatment options were excluded from the analysis

In pT/cT2 the number of patients who underwent surgery alone decreased, while surgery with adjuvant radiochemotherapy increased. The percentage of radiochemotherapy in patients with positive lymph node status increased from 23.6% to 29.6% (p=0.035) (not shown).

Survival analysis

Relative 5-year survival rates differed from 98.6% in stage pT/cT 1A to 11.2% in patients with a metastasis at time of diagnosis.

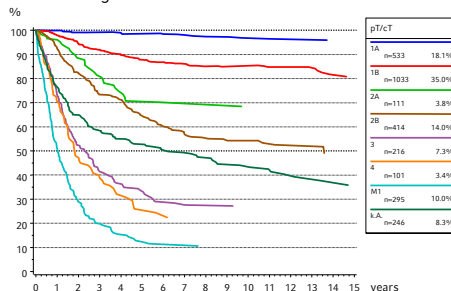


Fig 3.: Relative survival based on pT/cT stage

There was no difference in relative survival, time to locoregional recurrence or time to metastasis between patients diagnosed 1998-2009 and patients diagnosed 2009-2013.

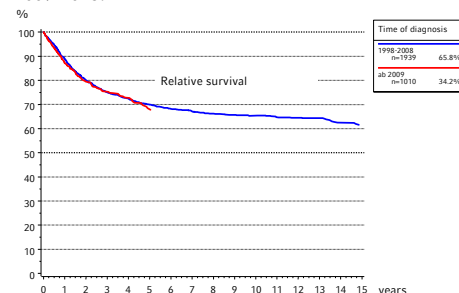


Fig 4.: Relative survival based on time of diagnosis

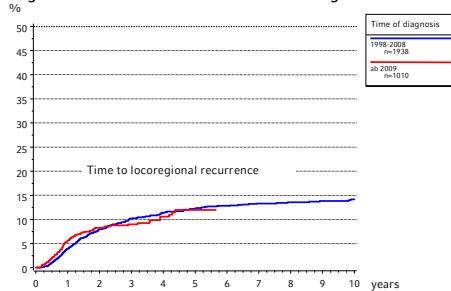


Fig 5.: Time to locoregional recurrence based on time of diagnosis (cumulative incidence)

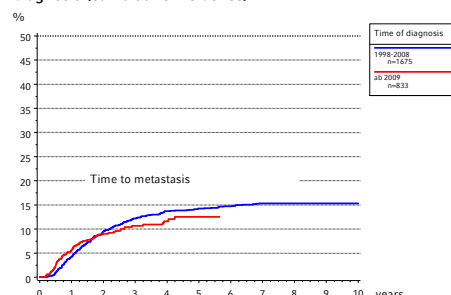


Fig 6.: Time to distant metastasis based on time of diagnosis (cumulative incidence)

Conclusions

There is a trend towards the increased use of radiochemotherapy, especially in advanced stages. In surgery there is a slight increase in the use of sentinel lymph node biopsy and an increase in R0-resections. Relative survival and time to locoregional recurrence and metastasis did not change over time.