Waiting time for treatment of women with breast cancer in Podlaskie Voivodeship (Poland) in view of place of residence. A population study

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▌ Abstract

Introduction: Treatment delay is a major problem of contemporary oncology. Knowing the time interval between diagnosis and initiation of treatment, together with monitoring this adverse prognostic factor, is an important element of the treatment planning process in the population and can contribute to the improvement of patients' curability.

Objective: To assess the waiting time for first treatment of women diagnosed with breast cancer in 2001-2002 in Podlaskie Voivodeship.

Materials and methods: During 2001-2002, there were 709 cases of women with breast cancer who reported to the Voivodeship Cancer Registry in Bialystok. 659 women were diagnosed with a primary invasive breast tumour. A cohort of 499 women who were treated with a curative intent was selected from this group. The waiting time in the created cohort was calculated as the number of days between the date of the breast cancer diagnosis and date of the first treatment.

Results: The average time between the date of diagnosis and date of the first treatment was 38 days. The median was 14 days. 28.6% of patients from the selected cohort waited longer than 28 days. The treatment of rural women was initiated faster than the treatment of urban patients.

▌ Key words

breast cancer, cancer control, waiting time for treatment, population study.

INTRODUCTION

Treatment delay constitutes a serious problem for oncological treatment and is a result of the increasing number of cancer patients, increasingly more complex and time-consuming treatment procedures, shortages of qualified personnel, insufficient radiotherapy equipment, and limited financial resources for the health care sector [1]. These problems occur in many countries [2, 3]. Delayed treatment, however, was considered to be an independent prognostic factor because it favours the progression of the disease [4, 5, 6]. This may be the result of the attitude of the patient or the doctor. It may also be the result of organisational and economic factors within the health care sector [7]. Organisational and economic causes of the treatment delay are particularly important from the public health point of view, because they can be eliminated by a properly conducted health policy, allocation of financial resources, and improvement in the management of resources.

The delayed treatment waiting time for treatment is an important aspect of the quality of oncological care, because it reflects treatment availability and affects the patient's sense of security. In the Polish health care system, mainly financed by public funding, the matter of treatment availability, the order

of granting benefits, and monitoring the average waiting time is regulated by the Act of 27 August 2004 on healthcare services financed from public funds. The Act imposes an obligation to monitor the waiting time for the service delivery on the service providers financed from public funds.

According to the recommendations published by the Canadian Association of Radiation Oncologists (CARO) in Canada and the Joint Council of Clinical Oncology (JCCO) in the UK, the waiting time should not exceed 28 days [2, 8]. To date, these are the only written recommendations concerning the waiting time for oncological treatment. They are a standard that may serve as a target which should be achieved while planning the treatment of breast cancer patients.

However, in practice it is difficult to obtain information on the waiting time between the disease diagnosis and initiation of treatment of breast cancer patients, which itself causes difficulties in the assessment of the health care quality in this group of patients. It is also difficult to refer the quality of this health care to the CARO and JCCO's recommendations.

In relation to the commonly occurring delays in the treatment of cancer patients, in order to assess the waiting time for treatment, using a standardised indicator is recommended. This indicator was defined during the realisation of the European Cancer Health Indicator Project (EUROCHIP) conducted under the auspices of the International Agency for Research on Cancer/World Health Organization (IARC/WHO), and which focuses on collecting the information on the effectiveness of cancer control with

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the use of recommended indicators. The list of indicators includes, among others, cancer epidemiology, knowledge about prognostic factors, data on the effectiveness of screening studies, and information about treatment [9, 10, 11].

The waiting time indicator is considered to be very important in countries where cancer control is implemented in a planned manner. According to the EUROCHIP report, together with other indicators, it is routinely available in many countries, while in the others efforts are being made to make it available [9, 11].

OBJECTIVE

The objective of the presented study was to assess the waiting time for first treatment of women diagnosed with breast cancer in 2001-2002 in Podlaskie Voivodeship.

MATERIALS AND METHODS

The study material was based on information collected from Cancer Registration Form MZ/N-1a from the Voivodeship Cancer Registry (CR) in Bialystok. The CR in Bialystok is one of 16 registries whose activity is coordinated by the National Cancer Registry (NCR). During the study period, the NCR covered a Polish population of 38,218,531 people, and the CR in Bialystok a population of 1,207,704 people in Podlaskie Voivodeship (urban – 711,300, rural – 496,404). The information collected from the CR in Bialystok was complemented with additional data sources: from patients' medical records, pathological laboratory documentations, specialist clinics, diagnostic centres, hospitals registries of the medical services.

In 2001-2002, 709 cases of women with breast cancer were reported to the CR in Bialystok. A group of 659 women was selected for the analysis. All the patients had been diagnosed with a primary invasive breast cancer. Of these 659 patients, 499 (75.5 %) were treated with a curative intent. In this cohort, the following variables were known: place of residence (urban/rural), date of birth, date of cancer diagnosis, stage of cancer, and date of the first treatment. The date of breast cancer diagnosis established on the basis of the CR in Bialystok was verified by analysing the above-mentioned additional data sources. The date on which the earliest information on the detection of the breast cancer appeared (clinical, histopathological or disclosed in additional tests), was considered the date of the beginning of the disease. The characteristics of the study cohort are presented in Table 1.

Table 1. The characteristics of the study cohort (n=499)

	Number of patients	(%)
Age groups		
15-49	171	(34.3)
50-69	275	(55.1)
≥70	53	(10.6)
Stage by ENCR		
local	198	(39.7)
regional	276	(55.3)
metastatic	25	(5.0)
Place of residence		
urban	367	(73.5)
rural	132	(26.5)

The waiting time for treatment in the study cohort was calculated according to the definition of this indicator used in the EUROCHIP project as being the number of days between the date of diagnosis and date of first treatment. The values of the indicators were calculated in total and for the groups of patients selected by age (15-49, 50-69, ≥70), disease stage (local, regional, metastatic) and place of residence (urban/rural).

In the existing division among age groups, a group recommended for screening was distinguished. A simplified tumour stage classification, recommended by the European Network of Cancer Registries (ENCR) for population registries (local, regional, metastatic), was used [12]. The information about the stage was known for all patients. The arithmetic mean and median waiting time for the first treatment were used in the statistical analysis.

The following treatments were applied as the first methods: surgery, chemotherapy, radiotherapy and hormonotherapy.

The Kruskal-Wallis test was used to compare the distribution of median waiting time in the groups of patients. The level of p≤0.05 was considered the level of statistical significance.

RESULTS

The average time from the breast cancer diagnosis to the date of the first treatment was 38 days and the median 14 days. These data, depending on the age group, stage of disease and place of residence are presented in Table 2.

Table 2. Waiting time for first treatment in the study cohort

	Number of patients	Average	Median	% > 28 days	Standard deviation
Age group					
15-49	171	38	16	28.6	87.1
50-69	275	35	13	26.5	71.7
≥70	53	52	17	39.6	94.0
			p=0.056		
Stage by ENCR					
Local	198	45	16	33.3	96.1
regional	276	33	13	26.8	68.0
metastatic	25	11	7	16.0	50.9
			p=0.169		
Place of IResidence					
Urban	367	40	13	29.4	86.7
Rural	132	31	16	27.3	55.9
			p=0.316		
Total	499	38	14	28.6	79.8

The average waiting time for treatment varied depending on the age group. In the group aged 15-49, it was 38 days, in the group aged 50-69 – 35 days, and in the oldest group – 52 days. The differences in waiting times for treatment in the division that takes into consideration the group recommended for screening were at the limit of statistical significance (p=0.056).

The waiting time for first treatment was the longest for the patients with a local stage – approximately 45 days; patients with a regional stage waited for 33 days, while those with a

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metastatic stage – 11 days. The differences in waiting times depending on the ENCR simplified classification were not statistically significant. Urban women waited for approximately 40 days for the first treatment, and rural women waited less, for approximately 31 days (Tab. 3).

Table 3. Waiting time for first treatment by place of residence and age group in the study cohort

Age group		No. of patients	Average	*Median*	*Standard deviation*
15-49	Urban	126	41	*15*	*98.6*
	Rural	45	28	*18*	*39.1*
50-69	Urban	206	37	*12*	*76.0*
	Rural	69	30	*15*	*57.1*
≥70	Urban	35	56	*17*	*100.3*
	Rural	18	45	*17*	*82.8*

Taking into account the existing division among age groups, for patients living in rural areas in each group, the average waiting time for first treatment was shorter than for patients from urban areas. Furthermore, in the case of women living in rural areas, the average waiting time increased with age. On the other hand, the waiting time for patients from urban areas depending on the age group varied. Women from the group of 50-69-year-olds waited for the shortest period of time, approximately 37 days. In addition, in the group recommended for screening, the difference in the average waiting time for first treatment between the urban and rural residents was the smallest.

The median waiting time for treatment trends, which depended on the place of residence, differed from value trends of the average waiting time. However, similar to the case of average waiting time, the median value was the lowest in the group aged 50-59 years.

The waiting time for first treatment was calculated for urban and rural areas while also taking into consideration the stage of development the breast cancer according to ENCR simplified classification (Tab. 4).

Table 4. Waiting time for first treatment by place of residence and stage of disease according to ENCR simplified classification in the study cohort

Stage		No. of patients	Average	*Median*	*Standard deviation*
Local	urban	147	44	*15*	*101.7*
	rural	51	49	*19*	*83.7*
Regional	urban	203	38	*13*	*77.8*
	rural	73	21	*15*	*21.1*
Metastatic	urban	17	38	*17*	*60.0*
	rural	8	13	*9*	*12.1*

Taking into consideration the stage of the disease, the average waiting time for the first treatment was the longest for patients with the local stage, for both urban and rural areas. In that stage, the average waiting time for treatment in rural areas was longer than in the urban areas. In cases of higher stages, the waiting time trends for treatment were reversed, because the average waiting time, in both urban and rural areas, shortened with the increase in the stage of the disease. The patients with regional and metastatic stages of development who lived in rural areas waited for treatment initiation less than women living in urban areas.

Moreover, the waiting time for rural patients significantly shortened in the higher stages of development – both the average and median. This trend of contingencies was less explicit in urban areas.

DISCUSSION

Worldwide, the impact of waiting time for the first treatment has been evaluated only in a few studies, and the existing evidence stems from observation or comes from mathematical models. The study carried out by R. Wyatt et al. confirmed the adverse impact of delayed treatment on the progression of the tumour for breast cancer patients. In these studies, mathematical models were used [13, 14].

In Poland, apart from the EUROCHIP Pilot Studies [9], there have been no systematic population studies that evaluate the waiting time for the first treatment, and the impact of delayed treatment on the curability of women with breast cancer. M. Pawlicki conducted some clinical studies in this area which showed that the main causes of the delay in oncological treatment are: attitude of patient and doctor, delayed diagnosis, poor organization, and the patient undertaking unconventional treatment methods [7, 15, 16].

In most studies conducted worldwide, the groups of patients are heterogeneous, in different stage of disease and in which treatment methods and used procedures are varied. Among these studies, the most important prove that with the waiting time for treatment the disease progresses [4]. The tumour progression while waiting for radiotherapy and the worsening of the prognosis were confirmed for patients with nasopharynx, larynx and other neck tumours, and also with cervical, lung and breast cancer. Attempts to systemise these studies and demonstrate the influence of the delayed treatment as an independent prognostic factor are included in the publications of M. Richards et al, E. Choan et al, C. Gonzalez San Segundo et al [17, 18, 19].

The evaluation and monitoring of delay in oncological treatment are complicated because of the difficulty, big expense and controversy connected with organizing the research aimed at measuring the waiting time for treatment. In this respect, although retrospective population studies meet the criteria for good epidemiological practice and conducting prospective studies, they do not comply with the ethical rules for clinical research.

The time interval between diagnosis and initiation of oncological treatment calculated in Podlaskie Voivodeship was slightly shorter than the waiting time calculated within research carried out in the UK. This research, conducted by R. Robertson et al., showed that women with breast cancer diagnosed in 1997-1998 waited approximately 42 days for the first treatment [20].

The results of the research conducted in a similar study period in Germany, aimed at calculating the delay in treatment delay for organisational reasons, also correspond with the research results from Podlaskie Voivodeship. V. Arndt et al. calculated that the median waiting time for breast cancer patients in 1996-1998 was 15 days, which was similar to the median waiting time in Podlaskie Voivodeship [21]. The proportion of patients whose treatment was initiated in a time exceeding a month since diagnosis, was similar to the proportion in Podlaskie Voivodeship (27.0%). M. Montella et al, evaluating the waiting time in Italy, recorded an equally

high percentage of patients waiting more than a month for the treatment. Among 644 women with breast cancer diagnosed in 1998-1999, 204 (31.7%) also waited more than a month for the treatment [22].

Research by I. Collins et al. showed that in Ireland the time interval from diagnosis to the initiation of treatment in 2001-2006 was 8 days, and in 2006 – 15 days [23].

In Podlaskie Voivodeship in 2001-2002, the waiting time for the first treatment for women recommended for screening age (50-69 years), was the shortest. Although during the study period in Poland there was no nationwide early detection programme, in Podlaskie Voivodeship occasional educational activities with a regional range were undertaken. They were aimed at an early detection and increase in women's knowledge about risk factors.

In the available literature, there are differences related to the age and delay with the initiation of cancer patients' treatment. In some studies it was shown that young women waited for the treatment longer than those who were older [22, 24, 25, 26, 27, 28]. R. Robertson et al. evaluated that the waiting time of women with breast cancer women aged 50 and younger was longer than in the older age groups, and was approximately 59 days [20]. The longest waiting time in the same age group was recorded by V. Arndt et al. In comparison to the older age groups, the median waiting time in Germany in 1996-1998 was the highest – 17 days. These assessments are consistent with the result obtained in the presented study.

It seems that the shorter waiting time for first treatment in the women recommended for screening in Podlaskie Voivodeship resulted from a higher risk awareness, which was an effect of the education that accompanied the screening. It was also the result of breast control activities undertaken in that period which were aimed at an early detection.

The results of studies on the influence of the stage of breast cancer on the waiting time are diverse and usually difficult to compare. An ambiguous relation of stage of the disease stage and prolonged waiting time is shown in a study by V. Arndt et al. The existence of this relation was confirmed for patients with a higher stage of disease who waited more than 7 days for the treatment. In the same study, but with the use of different waiting time categories (<1 month, 1-3 months, >3 month), there was no statistically significant correlation between the stage of disease and waiting time [21].

M. Montella et al. did not demonstrate a relation between delay in treatment and stage of breast cancer at the moment of detection. They did confirm the existence of a relation between the waiting time and age, but did not show this correlation as far as the stage of development, size of tumour, condition of the lymph node, and patients' education level are concerned [22].

However, some researchers have demonstrated this correlation. The studies of N. Mayo et al. showed that in Canada in 1992-1993 patients with more advanced cancer waited a shorter time for treatment [29]. A similar trend was observed in studies in the presented study in which the treatment of patients with a higher stage of breast cancer was initiated sooner than the treatment of patients with a local stage. The longest waiting time for the first treatment of patients with breast cancer in a local stage was also showed by S. Gorin et al. The studies on women with breast cancer diagnosed in 1992-1999, carried out under the auspices of the American National Cancer Institute, showed that patients

with a local stage of cancer were at greater risk of a delayed treatment than women with a higher stage of the disease [30].

The diagnosis of patients with a more advanced disease is faster because it consists of less time-consuming procedures which are necessary for the diagnosis of breast cancer in its early stages. In the period between diagnosis to initiation of the treatment initiation, time is of the essence to perform diagnostic procedures and plan an optimal treatment strategy. These processes become increasingly more expensive and time-consuming, which makes it difficult to implement the treatment without delay. The relation of treatment delay with a number of diagnostic procedures was demonstrated by P. Afzelius et al and N. Mayo et al. They confirmed that the result of the tumour detection in more advanced stage, which is easier to interpret, shortens the time to the initiation of treatment [24, 29].

In Podlaskie Voivodeship the waiting time for the first treatment of rural patients was significantly shorter (approximately) in comparison to urban patients, but it varied depending on the age group. The waiting time in urban and rural areas varied also depending on the stage of the disease. The smallest variation in the waiting time depending on the patient's place of residence occurred among patients with a local stage cancer.

In the available literature there are no similar studies on the delayed treatment and patients' place of residence in European countries. The possible poorer access to the treatment for rural residents was an issue that interested researchers in the USA. One of the elements of the evaluation of results of the National Breast and Cervical Cancer Early Detection Program, carried out under the auspices of the Centers for Disease Control and Prevention in USA, was a calculation of the waiting time. L. Caplan et al. estimated that in 1991-1995 the median waiting time for the first treatment for rural residents was 8 days, and for urban residents – 10 days [31].

In Podlaskie Voivodeship the shorter waiting time in rural than in urban areas for the first treatment may result from a varying availability of centres in which breast cancer detection and its treatment are possible. Due to the big distances and lengths of time that rural residents had to spend in order to reach the centres in which the treatment was possible, it is very likely that during one hospitalisation the number of procedures was maximised, including procedures related to the initiation of the treatment. This approach probably resulted from the understanding of the personnel of the importance of the distances to a healthcare centre, and an attempt to reduce the number of uncomfortable journeys and the expense involved for the patients. In the case of urban patients, arranging consultations, tests, or the initiation of the multi-staged treatment was easier, even though it prolonged the waiting time, there was no necessity for travel involved.

The centres for rapid oncological breast cancer diagnosis could have helped with the reduction of inequalities in access to modern methods of diagnosis and treatment, which were observed in Podlaskie Voivodeship between residents of urban and rural areas in 2001-2002. Such centres did not function during the study period.

In Poland, the National Cancer Control Programme adopted by the Polish Parliament in 2005 is currently being realised. With regards to the programme's commencement, after a long break in the planned cancer control in Poland, possibilities for new activities have arisen. One of the

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programme's strategic goals is the creation of centres for rapid oncological breast cancer diagnosis. These activities are aimed at shortening the waiting time. Scandinavian countries have valuable experiences in this field; in Finland, for instance, for patients for whom a radical treatment is planned, the creation of specialised multidisciplinary teams responsible for a carefully planned, rapid and cost-effective diagnosis to establish indications for treatment, is being considered [32].

It should be stressed that the assessment of the waiting time indicator in the presented study may serve as an example of an audit referring to the use of the binding recommendations for diagnostic and therapeutic procedures in the study period. In the study cohort, 28.6% of patients started their treatment more than 28 days after diagnosis. Assuming the criteria of the JCCO, this was a high proportion of patients at risk for delay. In Poland, an audit of the waiting time for treatment of breast cancer patients has never been carried out, but in the literature there are the results of similar national or regional audits carried out in other countries. Such audits have been conducted in the UK, Canada and France [2, 6, 8, 33, 34, 35, 36]. The results constituted the basis for the formulation of rules related to indications for treatment acceleration, and organization of the system for oncological treatment, thus improving the quality of cancer patients' treatment.

The more effective breast cancer control in many European countries is reflected in the higher average value of the standardised indicator of relative 5-year survival rate in Europe (79.3%), compared with the standardised indicator of the relative 5-year survival in Podlaskie Voivodeship (69.4%) [37]. The delayed treatment that occurs in Podlaskie Voivodeship may be one of the reasons for the low values of the 5-year survival indicator for patients with breast cancer.

Low survival values, long waiting time for treatment, and the diversification of the diagnostic and treatment methods constitute sufficient reasons for the standards of procedures used for diagnostic and treatment of breast cancer patients being published in Poland. Until such time as they are published, a careful observation of patients on the 'waiting list' and treatment acceleration according to the individual recommendations are necessary.

The waiting time for treatment calculated for breast cancer patients in Podlaskie Voivodeship allowed assessment of the scale of the occurrence of delayed treatment. However, the calculations may be subject to a certain error resulting from the diversification of the criteria for determining the detection date. The study adopted the criteria indicated by the IARC recommending using the date when the earliest information on the breast cancer detection appeared [38]. Taking into consideration the completeness of the breast cancer diseases registration in the CR in Bialystok, an average of 95.6% in 2001-2002, the number of information sources on which verification of the detection date and treatment initiation in the study cohort was based, it can be admitted that the population data was almost complete and characterised by high quality.

CONCLUSION

The presented study allows assessment of the breast cancer waiting time indicator in Podlaskie Voivodeship, which evidences the existing possibilities for the systematic conduct of such research.

The average waiting time for the first treatment was 38 days, which exceeded the standard recommended by the JCCO and CARO [2, 8]. The delay that was longer than that recommended concerned 28.6% of the patients.

The waiting time for the first treatment of patients with the disease at an early stage and among the youngest and oldest women, was particularly long. The treatment was initiated faster for rural than for urban patients.

The creation of a rapid oncological breast cancer diagnosis centres should be one of the priorities in the improvement of the breast control's effectiveness in Podlaskie Voivodeship; this may reduce the observed inequalities in access to treatment reflected in long waiting times, and differences between the urban and rural residents.

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