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The Impact of Covid-19 Pandemic in the Diagnosis of Breast Cancer in Albania

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Abstract

Introduction: Since the beginning of the quarantine from COVID19, in March 2020, the Albanian Ministry of Health and Social Protection, according to WHO recommendations, recommended everyone to avoid going to the doctor's office unless in case of emergency, in order to avoid exposure to groups of people that would lead to bigger chances of contracting the infection.

Objective: To understand if the COVID19 pandemic has impacted the number of cancer cases diagnosed during the years 2020 and 2021, in comparison to 2019. To understand if the COVID19 pandemic has impacted the stage in which the disease was diagnosed, in 2020 and 2021 compared to 2019. To see if there is any change in the number of triple negative breast cancer diagnosed during 2020 and 2021 compared to 2019.

Methods: We collected and analyzed a total of 1562 biopsy data for three years from 2019 to 2021, from the archive of the Service of Surgical Pathology and performed a comparative analysis of the number of cases diagnosed each year and number of cases diagnosed each month. We used Fisher's test and Odds ratios to evaluate staging differences for biopsies over these three years. We examined whether there were any linear trends for changes in breast cancer diagnoses by month within a year.

Results: Our analyses do not support significant changes in the proportion of cancers diagnosed

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by stage over the years, Stage 2 being the most common. There is not a significant change in the total number of diagnosis from year to year (p=0.20). Our model for 2020, supports a significant increase of total diagnoses by month (p-value: 0.03). For 2021, the monthly increasing trend is also significant, but more weakly so (p-value: 0.094). There were no significant changes in the mean age of the patients (p=0.2) from year to year. There were no significant changes in the triple negative diagnosis (p=0.1).

Conclusion: Covid19 has influenced the total number of diagnosis, with an increase during the second half of the year 2020 with no direct influence in the disease stage. However further studies need to be done in the evaluation of new cases and disease stage in a longer term basis.

Keywords: breast cancer, Covid-19, monthly biopsies, stages.

INTRODUCTION

According to World Health Organization, during 2020, there were 2.3 million women diagnosed with breast cancer, and the number of deaths, globally, was 685 000.

From 2015 to 2020, 7.8 million women were diagnosed with breast cancer, hence breast cancer is considered the most prevalent cancer in the world (1).

In Albania, according to the national registry of cancer, 700 new cases of breast cancer are diagnosed per year. In 2018, there were 708 new cases of breast cancer. The mortality from breast cancer has been increasing rapidly from the 90s and on, 230 being the total number of deaths in 2018 (2).

Since the beginning of the quarantine due to COVID19, in March 2020, the Ministry of Health and Social Protection, according to WHO recommendations, recommended everyone to avoid going to the doctor's office unless in case of emergency, in order to avoid exposure to groups of people that would lead to bigger chances of contracting the infection (3).

Also all over the world, the first wave of COVID-19 influenced the delivery of health services.

According to a survey made in Europe, in order to evaluate the impact of COVID-19 in surgical oncology, the first wave of the pandemic had a significant impact in surgical oncology (4).

In this study we aim to understand if COVID19 has impacted cancer diagnosis and the stage of the disease for this three-year period, impacting therefore the prognosis and overall survival.

METHODS

We gathered 1562 cases of breast biopsies performed during 2019, 2020 and 2021 from the Service of Surgical Pathology in the University Hospital Centre Tirana. An analysis of the total number, monthly biopsies examinations and their corresponding staging was performed. The mean age of the patients, and their biological status was defined. Using Fisher's statistical test and Odds ratios, we evaluated if there was any significant difference (increase/decrease) in the stage of breast cancer in the diagnoses made in 2019, 2020 and 2021, after the quarantine. Further, a linear regression model was built, to understand if when considering the total number of diagnoses, there was an increase of breast cancer diagnosis by month, during 2020 and 2021 compared to 2019.

RESULTS

During 2019 there were a total of 509 breast cancer cases, with a peak of diagnosis in December with 65 breast cancer diagnosis made this month (Figure 1).

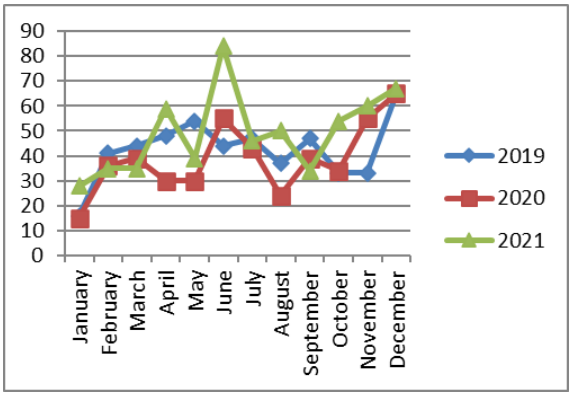

Figure 1. The number of breast cancer biopsies performed monthly during the years. Notice the low number of diagnosis on April and May of 2020

The mean age of the patients diagnosed with breast cancer during 2019 was 58,1. In 2019 there were 147, stage 2 cases of breast cancer, which was the most common stage, followed by stage 1 with 104 cases. (Figure 2) There were 15 cases of triple negative patients (2.9%), diagnosed.

There were 148 stage 2 diagnosis, also the most common stage for 2021, followed by stage 1 cases, 89 of them (Figure 2). There were 6 triple negative patients (1%).

We found out that there were no significant changes in the mean age of the patients at the time

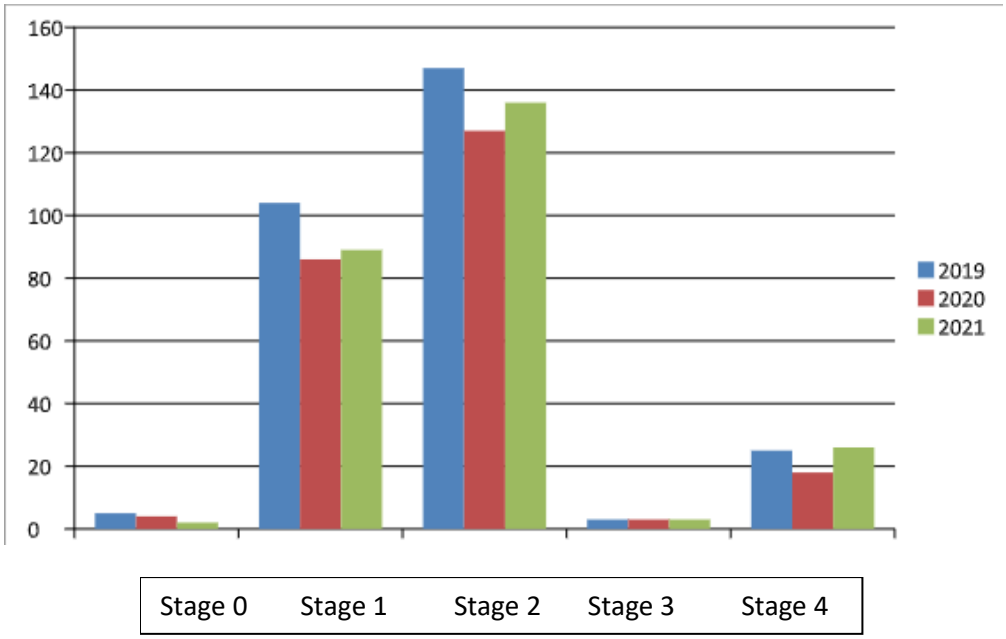

Figure 2. Stages of breast cancer. Notice that stage 2 is the commonest, followed by stage 1

In 2020 there were 465 breast cancer cases, with a peak of diagnosis also in December, with 65 cases this month (Figure 1). The mean age of patients for 2020 was 56.9 years. There were 127 stage 2 cases, which was also the most common stage for this year, followed by stage 1 with 86 cases (Figure 2). In 2020 there were 10 cases of triple negative patients (2.2%).

In 2021 were diagnosed a total of 591 breast cancer diagnosis, with a peak of diagnosis in June with 84 diagnosis made this month (Figure 1). The mean age of patients for 2021 was 56.5 years.

of diagnosis ($p=0.2$) from year to year. There were no significant changes in the triple negative number of patients diagnosed in these years ($p=0.1$).

The analysis focused on the staging of breast cancer at diagnoses, and whether there were any significant differences in diagnosing stage 1 vs. higher-stage (>1) cancer, or stage 4 vs. lower stage (stage <4) cancer in each year, 2019, 2020, and 2021. This analysis revealed that although there is some variability in the proportions of different stages diagnosed each year, these

differences are not significant. Applying Fisher's test, we found that there was no significant difference in diagnosing stages higher than 0 vs. 0 for 2019-2020: (Odds ratio: 1.106184 ((95%CI: 0.2,5.2), p=1); neither for stages higher than 1 vs. 1 for 2019-2020: (Odds ratio =1.248642 (95%CI: 0.2,4.9) p=0.2405. When comparing the other years, 2020-2021, we again did not find significant differences, but the empirical odds ratios were lower: for comparison of stages >0 vs. 0 for 2020-2021: Odds ratio =0.44 (95%CI: 0.04,3.1) p=0.4277; neither for later stage cancer 1 vs. >1 2020-2021. Odds ratio=0.85 (95%CI: 0.58,1.25) p=0.4532. The fact that empirical odds ratios (2019-2020) are slightly above 1, and those for 2020-2021 are below 1, suggests that there is a trend for severe cancers to be diagnosed in year 2020, compared to the other years, but this trend was not statistically significant. Notice, that even when we examined stage 4 vs. stage lower than 4 cancers, the empirical odds ratios suggest higher values of the relative proportions of severe cancers in the year preceding the pandemic 2019, and the year 2021, compared to the year 2020 when the pandemic hit, but without being statistically different from 1. The odds ratio for stage 4 vs. lower than 4 (2021-2020) was 1.72 (95%CI: 0.84 3.67) but p=0.1372. The odds ratio for stage 4 vs. <4 (2019-2020) was 1.55 (95%CI 0.7540875 3.3089901) p=0.25 (Table 1).

Table 1. The fact that empirical odds ratios (2019-2020) are slightly above 1, and those for 2020-2021 are below 1, suggests that there is a trend for severe cancers to be diagnosed in year 2020, compared to the other years, but this trend did not reach significance. Notice, that even when we examined stage 4 vs. stage lower than 4 cancers, the empirical odds ratios suggest higher values of the relative proportions of severe cancers in the year preceding the pandemic 2019, and the year 2021, compared to the year 2020 when the pandemic hit, but without being statistically different from 1.

	Stage 0	Stage >0		Stage 1	Stage >1
2019	5	325	2019	104	221
2020	4	245	2020	87	148
	Stage 0	Stage >0		Stage 1	Stage >1
2020	4	235	2020	87	148
2021	2	266	2021	89	177

According to the total numbers of diagnoses, there is an average global monthly diagnosis rate of 23.79 breast cancer cases diagnosed per month (Figure 3).

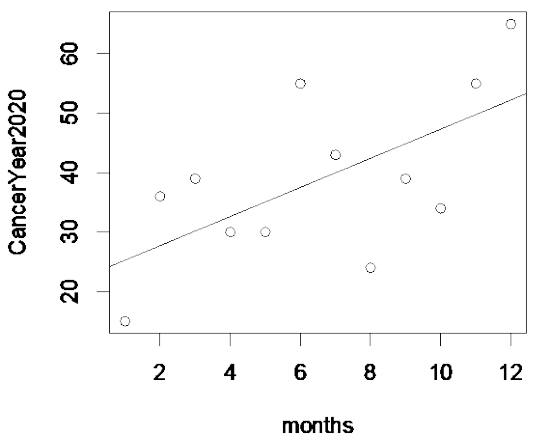

Figure 3. The distribution of breast cancer diagnosis through the months in 2020

The linear model for 2020, is significant (p= 0.02982) suggesting a positive increasing trend with rate 2.4 diagnoses per month.

We cannot confirm statistically that there is a significant change from year to year (p=0.20). However, we found that there is a significant increasing trend in the rate of monthly diagnosis for 2020 and 2021 (not for 2019, p=0.266).

The linear model for 2020, is significant (p= 0.02982) suggesting a positive increasing trend with rate 2.4 diagnoses per month, with a bigger number of cases diagnosed in June, July, November and December.

The linear model for 2021, confirms also a significant increasing trend (p= 0.09422) diagnoses per month, with a bigger number of cases diagnosed in June, November and December.

These results are in line with expectations of a conserved total number of diagnoses per year, but lower than average total number in the first half of the year, and higher than average total number in the second half of the year for 2020 and 2021.

DISCUSSION

The total number of diagnosis of breast cancer before the pandemic, compared to that during the pandemic has not been significantly changing (p=0.2), according to our study.

When it comes to the analysis of monthly change in the number of diagnosis, we see that there is a significant increase in diagnosis in the second half of the year in 2020 (p= 0.02982), compared to 2019.

In the first half of the year (when the first peak of the pandemic took place) there was a lower than average total number of diagnosis, as expected. In the second half of the year, when health services were back to normal and the quarantine measures were loosened, there was a higher number of diagnosis.

In the study by Young-Joon Kang and Jong Min Baek the data of breast cancer patients, divided in two groups, group A (February to April) and group B (May to July) were compared. They found out that there was a decrease in the total number of diagnosis during the group A diagnosis period, compared to the group B diagnosis period, confirming the impact of the pandemic on the diagnosis made during that period of time (5).

In our study, in 2020, April and May were the months with a lower number of breast cancer diagnosis. In a study of the Croatians Eduard

Vrdoljak and Melita Perić Balja resulted that there was a 24% reduction of the newly diagnosed breast cancer cases in Croatia during April, May, and June compared with the same period of 2019. However, during 2020, only 1% fewer new cases were detected than in 2019, or 6% fewer than what would be expected based on the linear trend during 2017-2019 (6).

There was yet another American study that supports the findings of our study, in which, in March-July 2020, in comparison with the baseline period of March-July 2019, there is a substantial decrease in cancer screenings, visits, therapy, and surgeries, with variation by cancer type and site of service. At the peak of the pandemic in April, screenings for breast, colon, prostate, and lung cancers were lower by 85%, 75%, 74%, and 56%, respectively (7).

In another study made in Netherlands, by Anouk H Eijkelboom and Linda de Munck the incidence declined across all age groups and tumor stages (except stage IV) from 2018/2019 to 2020. Yet clarification is needed on how this has affected stage migration and outcomes (8).

In our attempt to understand if there was a difference in staging in the diagnosis made in 2020 and 2021 compared to 2019, we came to the conclusion that there are data that suggest that there is an increasing trend for severe cancers to be diagnosed in 2020, compared to the other years, but they are not statistically significant, meaning that there is no difference in the stage of breast cancer diagnosed later during the pandemic, compared to the breast cancer diagnosed prior the pandemic.

In a study made by Jennifer E Tonneson and Tanya L Hoskin, breast cancer stage at diagnosis, also did not differ significantly during-COVID-19 compared with pre-COVID-19 (9).

The mean age at diagnosis didn't significantly change from year to year, making it clear that although there has been a delay in the diagnosis of breast cancer, this delay has been a delay in weeks or months not more than that.

The number of triple negative patients hasn't differed significantly, from 2019 to 2020 and 2021.

After this study, we came to the conclusion that the impact of COVID-19 in breast cancer, in Albania, was not as big as we first thought. Although COVID-19 has impacted our lives in different ways, economically and health wise, fortunately it has not impacted the stages in which breast cancer is diagnosed. Regarding the impact of COVID-19 in prognosis and overall survival, there is no clue in our data. The long term impact COVID-19 might have had in cancer patients, regarding their prognosis and quality of life, will be seen in the years to come.

CONCLUSION

Covid19 has influenced the total number of diagnosis, with an increase during the second half of the year (2020), with no direct influence in the disease stage. However further studies need to be done in the evaluation of new cases and disease stage in a longer term basis.

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Conflict of Interest Statement: The authors declare that they have no conflict of interest.

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