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Research Article

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Distribution of Cancer of Multiple Myeloma in Jamaica 2008

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Abstract

Objective: *To determine the distribution of multiple myeloma in Jamaica 2008.*

Methods: *The study included all fourteen parishes. Data obtained from the Jamaica Cancer Registry located in the Pathology Department of the University of the West Indies. Population denominators obtained from the 2011 census taken by the Statistical Institute of Jamaica. The statistical package which was used to analyze the data was excel.*

Results: *Onset of multiple myeloma (MM) in Jamaica 2008 began in the age group 20 years to 24 years. The highest frequencies occurred in the age groups 60 years to 64 years, 70 years to 74 years and 75 years to 79 years. The median age at which MM was diagnosed was 69 years. These results indicate that age is an important risk factor in developing multiple myeloma. The crude incidence rate (CIR) was determined for both sexes in Jamaica 2008. In the case of males, the CIR for multiple myeloma was 1.5 and in the case of females, the CIR for multiple myeloma was 1.0, (male/female ratio, 1.5). Hence, there was a greater probability of males developing multiple myeloma compared to females. The CIR used to determine the probability of someone developing multiple myeloma in each parish in Jamaica. Kingston and St. Andrew were treated as one as they are so interwoven. The highest probability of developing multiple myeloma was for someone residing in Manchester (2.6), Kingston and St. Andrew (2.3), St. Ann (1.7), St. Catherine (1.5), Portland (1.2) and St. Thomas (1.1).*

Conclusion: *In mitigating multiple myeloma, it is important that the public be educated regarding the risk factors associated with this cancer such as age, sex, race and family history. It is also critical that screening is done by 45 years of age.*

1. Introduction

Since the inception of the Jamaica Cancer Registry in 1958, the incidence of cancer in Jamaica has been monitored by reports being produced regularly [1]. These reports are based upon the incidence of cancer in males and females in Kingston and St. Andrew, which forms the population base of the registry [1,2]. Multiple myeloma is a malignant plasma cell tumor of the bone marrow, which destroys bone tissue. Gibson et al. (2008) determined the crude incidence rate (CIR) for multiple myeloma for males and females in Kingston and St. Andrew for the period 1998 to 2002 [1]. In the case of males, the CIR was determined to be 2.8 and in the case of females, it was 2.4. This present study has been undertaken to investigate the distribution of multiple myeloma across all fourteen parishes in Jamaica in the year 2008.

2. Methods

2.1. Study Population

This research project consists of persons from all parishes in Jamaica. A map of Jamaica is shown in Figure 1 [3].

Figure 1: Map of Jamaica Showing all the Parishes

Data was obtained from the Jamaica Cancer Registry located in the Pathology Department of the University of the West Indies. The methodology of the registry has been previously stated [4,5]. Cases are registered from information gleaned from public and private hospitals and general practitioners in Kingston and St. Andrew then verified by pathologists at Jamaica Cancer Registry in accordance with standard techniques of registration [6].

2.2. Data Extraction

Variables that were obtained from the Jamaica Cancer Registry included cancer code, date of diagnosis, age at diagnosis, permanent residence, parish of birth, diagnosis, gender, smoker, source of case and date of death. The codes used for classification of the various types of cancers were cross-checked using the tenth edition of the International Statistical Classification of Diseases and Related Health Problems (ICD – 10) [7]. Population denominators were obtained from the 2011 census taken by the Statistical Institute of Jamaica, Kingston, Jamaica [8].

2.3. Statistical Analysis

The statistical package which was used to analyze the collected data was Microsoft excel. The crude incidence rate (CIR) was also determined. It was calculated by dividing the total number of cases of cancer diagnosed in a specific population by the size of the population and then multiplying the result by 100000 [1,2].

3. Results

Age/yr	Frequency		
	Both Genders	Male	Female
0 – 4	0	0	0
5 – 9	0	0	0
10 – 14	0	0	0
15 – 19	0	0	0
20 – 24	1	1	0
25 – 29	0	0	0
30 – 34	0	0	0
35 – 39	0	0	0
40 – 44	1	0	1
45 – 49	1	1	0
50 – 54	4	2	2
55 – 59	2	2	0
60 – 64	6	5	1
65 – 69	3	2	1
70 – 74	6	3	3

75 – 79	8	3	5
80 – 84	1	1	0
85 – 89	0	0	0
90 – 94	0	0	0
95+	0	0	0
TOTAL (N)	33	20	13

Table 1: Frequency Table Showing Grouped Data of Persons Diagnosed with Multiple Myeloma in Jamaica 2008

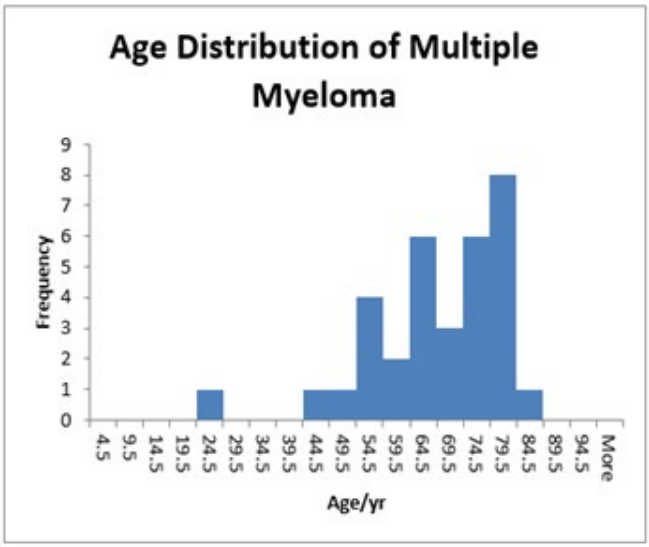

Figure 2: Histogram showing the Distribution of Multiple Myeloma in Jamaica 2008

Parish	Cancer Cases	Population Size	Crude Incidence Rate
Manchester	5	189797	2.6
Kingston and St. Andrew	15	662426	2.3
St. Ann	3	172362	1.7
St. Catherine	8	516218	1.5
Portland	1	81744	1.2
St. Thomas	1	93902	1.1
St. Mary	0	113615	0
Clarendon	0	245103	0
St. Elizabeth	0	150205	0
Westmoreland	0	144103	0
Trelawny	0	75164	0
Hanover	0	69533	0
St. James	0	183811	0

Table 2: Comparing the Crude Incidence Rate of Multiple Myeloma for all Parishes in Jamaica 2008

4. Discussion

Table 1 shows that onset of multiple myeloma in Jamaica 2008 began in the age group 20 years to 24 years. The highest frequencies occurred in the age groups 60 years to 64 years, 70 years to 74 years and 75 years to 79 years. The median age at which multiple myeloma was diagnosed was 69 years. These results indicate that age is an important risk factor in developing multiple myeloma (MM). Kazandjian (2016) stated that MM is a disease of the older population and its incidence in the African American population is twice that of the European American population [9]. Palumbo and Anderson (2011) as well as Kyle et al. (2003) declared that the median age at diagnosis with MM was approximately 66 years to 70 years with 37% of patients being younger than 65 years of age [10,11]. In Jamaica 2008, 45% of those diagnosed were less than 65 years of age. Figure 2 shows a histogram of the data shown in table 1 when both sexes are considered. It can be clearly seen that the data is negatively skewed, having a value of -1.37. The CIR was determined for both sexes in Jamaica 2008. In the case of males, the CIR for multiple myeloma was 1.5 and in the case of females, the CIR for multiple myeloma was 1.0, (male/female ratio, 1.5). Bray et al. (2018) stated that the cumulative risk of being diagnosed from birth to 74 is 0.24% among men and 0.17% among women, making the disease about 1.5 times more likely in men [12]. Gibson et al. (2010) determined the CIR for both men and women in Kingston and St. Andrew Jamaica for the period 2003 to 2007. In the case of males, the CIR for MM was determined to be 3.5 and in the case of females, the CIR for multiple myeloma was 2.8, (male/female ratio, 1.25). This also indicated the predominance of multiple myeloma in males. This disease may be due to both environmental and genetic factors.

The CIR was used to determine the probability of someone developing multiple myeloma in each parish in Jamaica. Kingston and St. Andrew were treated as one as they are so interwoven. The highest probability of developing multiple myeloma was for someone residing in Manchester (2.6), then Kingston and St. Andrew (2.3), St. Ann (1.7), St. Catherine (1.5), Portland (1.2) and St. Thomas (1.1). This is all illustrated in table 2. Risk factors, which could have contributed to the variation, would be age, sex, race and family history. Lynch et al. (2001) stated in general multiple myeloma is not considered a genetic disease, however familial cases despite being rare do exist [13].

4.1. Limitations

In 2008 and earlier, there were two major cancer treatment centres in Jamaica for the public. These were Kingston Public hospital in Kingston and Cornwall Regional hospital in St. James. The machines they had at that time were cobalt machines. Hence, many cases would be referred to Kingston Public hospital from other parishes or to Cornwall Regional hospital. This would depend on the proximity and the accessibility, meaning the length of the waiting list. Staff at the Jamaica Cancer Registry only gets data from hospitals and private sources in Kingston and St. Andrew Jamaica. Hence, some patients from the western end of the island such as the parishes of St. James, Westmoreland, Trelawny and Hanover would not be recorded based upon the present practise. Hence, these would contribute to errors in the data from parishes in those regions of the island. In Kingston at that period, there was the Radiation Oncology Centre of Jamaica, which was established in 2001. This is a private centre for the treatment of cancer. Hence, the limitation here would be your socioeconomic status. There would also be persons who would seek alternative ways to treat their cancer.

5. Conclusion

It can be deduced from this study that in Jamaica 2008 men were more prone in developing multiple myeloma compared to women by a factor of 1.5. This was however comparable to other global studies. Other risk factors, which were highlighted from this study, were age and geographical location. To mitigate MM it is therefore important to educate the public as well as to initiate screening by age 45 years.

Data Availability Statement

The data used were not available online and permission granted is in the document attached.

Acknowledgement

I wish to express posthumous thanks to Professor Barrie Hanchard who provided insightful suggestions and access to the Jamaica Cancer Registry located in the Pathology Department of the University of the West Indies.

Synopsis

This study investigated the distribution of multiple myeloma in Jamaica 2008.

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