CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3934952

Available online at: http://www.iajps.com *Research Article*

COMPARISON OF HAEMOGRAM PARAMETERS OF PATIENTS WITH THYROID PAPILLARY CANCER

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Article Received: May 2020 **Accepted:** June2020 **Published:** July 2020

Abstract:
Introduction: *Papillary thyroid cancer (PTC) is the most epidemic type of thyroid cancers, accounting for approximately 80% of all diagnosed thyroid cancers.* ***Objectives:*** *The main objective of the study is to compare the haemogram parameters of patients with thyroid papillary cancer.* ***Material and methods:*** *This descriptive study was conducted in Gujranwala Medical College, Gujranwala during March 2019 to December 2019. Data related to PTC patients and those with nodular hyperplasia (NH). Age, gender, thyroid stimulating hormone (TSH) levels were noted. PTC patients were graded according to the tumour nodule metastasis (TNM) stages of the American Joint Committee on Cancer (AJCC) and only those with stage 1 were included as the number of patients graded to have other stages were insufficient and they were excluded.* ***Results:*** *The data was collected from 141 patients. Thyroglobulin levels of 23(43%) PTC patients ranged 0.04- 0.54ng/ml and 34(64%) received postoperative RAI. In 23(43.3%) PTC cases, tumour diameter was <1cm (range: 0.1-0.9cm) and in 30(56.7%) cases, the diameter was ≥1cm (range: 1-7cm). Nodule diameters of NH cases ranged 0.4- 7.5cm, and the diameters of PTC patients were significantly lower than NH patients (p: 0.001. In PTC patients, tumour localisation, tumour focus, lymph node metastasis and vascular invasion were noted.* ***Conclusion:*** *It is concluded that platelet indices, except PLR, cannot assist in distinguishing benign goiter from thyroid cancer.*

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Please cite this article in press Sabreena Hafeez et al, ***Comparison Of Haemogram Parameters Of Patients With Thyroid Papillary Cancer.****, Indo Am. J. P. Sci, 2020; 07(07).*

INTRODUCTION:

Papillary thyroid cancer (PTC) is the most epidemic type of thyroid cancers, accounting for approximately 80% of all diagnosed thyroid cancers. Over the past decade, PTC has maintained its prevalence in some regions of the world, leading to a higher incidence of PTC than that of other cancers. However, the prognosis of PTC, which is greater than 90% in 10-year survival postoperatively, is much better than the vast majority of other malignancies [1].

Papillary thyroid cancer (PTC) has relatively good prognosis. Even so the extrathyroid invasion of adjacent soft tissues is present in nearly 15% patients (range 534%) at the first surgery. About a third of PTC patients have clinically evident lymphadenopathy. Only 1-7% PTC patients have distant metastases at diagnosis [2]. Besides in 20-year follow-up, postoperative nodal metastasis development is 9%, local recurrence 5%, distant metastasis 4% and 20-year cancer-specific mortality 5%. Therefore, special attention is required in terms of diagnosis and follow-up. Malignant cells are associated with lymphocytes, leucocytes and platelets, resulting in a systemic inflammatory response [3]. Platelet indices, such as platelet count (PC), mean platelet volume (MPV), platelet distribution width (PDW), and neutrophil-lymphocyte ratio (NLR) are significant in most types of cancer. There are very few publications in literature investigating the relation between TPC and PLR [4].

The diagnosis of the disease is made by combining clinical and laboratory data. It usually includes a severe inflammatory episode accompanied by significantly elevated Erythrocyte Sedimentation Rate (ESR) and C Reactive Protein (CRP) levels. Symptoms usually include severe neck pain, weakness, muscle and joint pains, and fever that rises above 38.5°C. Erythrocyte Sedimentation Rate (ESR) usually rises above 50 mm/h and can sometimes be seen above 100 mm / h [5]. It is one of a few rare diseases that elevates ESR above 100mm/h in Internal Medicine Clinical Practice. Neutrophil Lymphocyte Ratio (NLR) and Platelet Lymphocyte Ratio (PLR) are currently popular parameters used in the study of many diseases ranging from acute and chronic inflammatory and infective, respiratory and cardiovascular diseases to solid malignancies and hematological malignancies [6].

Objectives

The main objective of the study is to compare the haemogram parameters of patients with thyroid papillary cancer.

MATERIAL AND METHODS:

This descriptive study was conducted in Gujranwala Medical College, Gujranwala during March 2019 to December 2019. Data related to PTC patients and those with nodular hyperplasia (NH). Age, gender, thyroid stimulating hormone (TSH) levels were noted. PTC patients were graded according to the tumour nodule metastasis (TNM) stages of the American Joint Committee on Cancer (AJCC) and only those with stage 1 were included as the number of patients graded to have other stages were insufficient and they were excluded. Also excluded were those aged below 18 years, those with clinical-subclinical hypothyroidism or clinical hyperthyroidism (TSH≥ 4.4mIU/ml) diabetes, another cancer, inflammatory disease, myeloproliferative disorders, any organ insufficient, infection or suspicion of infection, anaemia, or those taking anticoagulant medicine and alcohol. Receiver-operating characteristic (ROC) analysis was conducted to specify the best cut-off value to predict the outcome when it was necessary. Differences were taken as significant at $p<0.05$.

RESULTS:

The data was collected from 141 patients. hyroglobulin levels of 23(43%) PTC patients ranged 0.04- 0.54ng/ml and 34(64%) received postoperative RAI. In 23(43.3%) PTC cases, tumour diameter was <1cm (range: 0.1-0.9cm) and in 30(56.7%) cases, the diameter was ≥1cm (range: 1-7cm). Nodule diameters of NH cases ranged 0.4-7.5cm, and the diameters of PTC patients were significantly lower than NH patients (p: 0.001. In PTC patients, tumour localisation, tumour focus, lymph node metastasis and vascular invasion were noted.

Table 01: Analysis of patients with papillary thyroid carcinoma with comparison of hemogram

	Papillary thyroid carcinoma	Nodular hyperplasia	*p*-values
Neutrophil count (cells/µl)	n=53	n=37	0.10
Mean ± SD	3964±1310	4470±1579	
Median (min-max)	1800-7300	1800-9770	
Lymphocyte count (cells/µl)	n=53	n=37	0.17
Mean ± SD	2163±467	2308±533	
Median (min-max)	1110-3610	1300-3380	
Neutrophil-to-lymphocyte ratio	n=53	n=37	0.61
Mean ± SD	1.90±0.80	1.99±0.82	
Median (min-max)	0.9-5.62	1.05-4.89	
Platelet count (cells/µl)	n=53	n=37	0.062
Mean ± SD	265981±57340	241783±63289	
Median (min-max)	132000-408000	147000-351000	
Platelet-to-lymphocyte ratio	n=53	n=37	0.015
Mean ± SD	126.82±32.16	109.31±34.18	
Median (min-max)	58.28-228.46	49.67-191.54	
Mean platelet volume (fl)	n=53	n=37	0.15
Mean ± SD	7.93±1.92	8.53±1.98	
Median (min-max)	3.3-12.6	3.1-11.8	
Platelet distribution width (%)	n=41	n=24	0.84
Mean ± SD	15.87±1.23	15.92±0.42	
Median (min-max)	10-17.8	15.2-17	
Plateletcrit (%)	n=31	n=23	0.28
Mean ± SD	2.50±0.35	2.63±0.48	
Median (min-max)	1.76-3.02	1.74-3.75	
Red blood cell distribution width ()	n=41	n=10	0.83
Mean ± SD	11.9±16	12.3±14.7	
Median (min-max)	13.47-0.93	13.54-0.80	
Haemoglobin (g/dl)	n=53	n=37	0.67
Mean ± SD	14.15±1.27	14.04±1.09	
Median (min-max)	12-17.6	12.10-17	

SD: Standard deviation

DISCUSSION:

Thyroid cancer is one of the most rapidly changing cancers of the past decade, and its staging system has undergone significant revisions in line with the eighth version of the AJCC Staging Guideline. Since the diagnosis of age is an independent risk factor and closely related to the prognosis of thyroid cancer, the cut-off age for predicting mortality has elevated from 45 to 55 years old [7].

As part of the host immune reaction, neutrophils exhibit diverse functions to dynamically regulate cancer-related processes. Among these, it has been demonstrated that tumor-induced neutrophils can facilitate tumor metastases via circulation. This

mechanism is also supported by various clinical retrospective analyses, including ours [8].

Similar to neutrophils, platelets play a pivotal role in cancer progression and metastasis. Emerging evidence suggests that platelets regulate neoangiogenesis, dissemination, and tumor cell growth [9]. However, platelet activation is closely by their size rather than their count. Platelet size can be evaluated by platelet volume parameters, such as MPV and PDW. MPV is an alternative index of platelet activation, and PDW demonstrates variation in platelet size, and both have been used to predict the prognosis of various cancers [10].

CONCLUSION:

It is concluded that platelet indices, except PLR, cannot assist in distinguishing benign goiter from thyroid cancer. MPV, PDW and lymphocyte number seemed to be effective as prognostic factors for PTC. High correlation with the common acute phase reactants and normalization with disease resolution showed that these parameters could provide additional benefit in the follow-up and correct treatment approach in the acute phase of the disease.

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