Coagulation Profile in patients with Breast Cancer

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Fifty subjects with breast cancer patients and 25 healthy control were included in this study. Routine hematological investigations i.e. Hb, TLC, platelets count were done by hematology analyzer and specific investigations like prothrombin time (PT), activated partial thromboplastin time (APTT) and fibrinogen level were performed by using commercially available kits. Results obtained were analyzed by using Student's 't' test and level of significance was done. Platelets count and fibrinogen levels were increased in breast cancer patients but PT and APTT were comparable with control group.
Key words: Breast cancer, PT, APTT

The coagulation disorders of non-haematological malignancies can cause either excessive clotting and excessive bleeding or the combined abnormalities of excessive clotting leading to consumption of coagulation factors and secondarily to excessive bleeding. The non-haematological malignancies include carcinomas e.g. breast, prostate, ovary, lung, stomach etc., and many other solid tumors[1,2].

Clinically, the relationship between malignancy and thrombosis has been obvious for over 100 years. Thrombo-embolism is present in up to half of cancer patients at autopsy and there is higher incidence of occult malignancy in patients with deep vein thrombosis (DVT). Thrombosis in cancer often is migratory and may involve superficial veins and relatively unusual sites. In the laboratory, evidence of intravascular coagulation is readily obtained. Some have thrombocytopenia, falling fibrinogen levels and raised fibrinogen degradation product (FDP), but these represent only the decompensated form of DIC, and a larger proportion has evidence of compensated or overcompensated DIC. Thrombocytosis is more common, and functional defects such as reduced adhesion, aggregation and clot retraction also may be observed[3,4,5].

Hyperfibrinogenemia is common but acquired dysfibrinogenemia is rare unless the liver is involved. As intravascular activation of coagulation and fibrinolysis occurs together, cancer patients may have shortened euglobulin clot, lysis times, decreased plasminogen levels, and an increase in plasmin-antiplasmin complexes. Most. patients with cancer complicated by acute DIC have elevated FDP levels. The likelihood of increased FDP is greater in patients with remote metastases, compared to localized disease and may have prognostic value.[6,7,8]

The purpose of the present study is to assess the coagulation abnormalities in patients of breast cancer and to help the clinician in early detection of DIC and management of patients at different stages of breast cancer.

Methodology:

Seventy five subjects were divided into two groups. Group I included 50 breast cancer patients and Group II included 25 normal, healthy controls. Five ml of blood was collected and was distributed as follows: 1.8 ml of blood was mixed with 0.2 ml of sodium citrate for PT, APTT and fibrinogen level. 3 ml of blood was mixed with EDTA for routine hematology tests [9]. The results and data obtained were subjected to statistical analysis by using Student's 't' test and level of significance was done[10].

Results

The results and level of significance of these groups are given in tables 1 and 2

Table 1 Routine Hematological Investigations in Group I and II

Tests	Group I (Breast Cancer Subjects)	Group II (Control)	Significance
Hb	11.8 ± 1.7	12.8 ± 0.99	HS
TLC	7.2 ± 2.1	7.5 ± 1.5	NS
Platelets	256.0 ± 91.6	227.1± 49.9	HS

Table 2: Specific Haematological Investigations in Group I & II

Tests	Group I (Breast Cancer Subjects)	Group II (Control)	Significance
PT	12.2 ± 2.17	12.8 ± 1.27	NS
APTT	25.9 ± 2.3	25.2 ± 2.5	NS
Fibrinogen	372.4±116.03	265.6±44.9	HS

Discussion

Haematological Investigations : In the present study, the Hb was found to be slightly lower in subjects with breast cancer as compared to control group (II) and difference was significant statistically. The findings are in agreement with that of Rickles et al (1992)[8] who also observed low Hb levels in subjects suffering from breast cancer. TLC in the present study was found to be lower in subjects with breast cancer when compared with controls though it was non-significant statistically. In the present study, the platelet count was found to be significantly higher ($p < 0.05$) in subject with breast cancer when compared with control. These results are in consistent with the findings of Francis et al (1985) [11] who also observed this change in breast cancer patients.

In the present study, PT and APTT were found to be comparable with control groups. Fibrinogen level were found to be significantly increased ($p < 0.01$) in patients with different stages of breast cancer when compared with controls. This study is in agreement with the findings of Gordon et al (1999) [12] who also observed significantly increased fibrinogen level in breast cancer patients.

Reference

1. Lane DA, Preston FE, Van Ross ME, Kakkar VV. Characterization of serum fibrinogen and fibrin fragments produced during DIC. Br J Haematol 1978; 40: 609-615.
2. Falanga A, Rickles FR. Pathophysiology of the thrombophilic state in the cancer patient. Semin Thromb Hemost. 1999; 25(2): 173-82.
3. Levi M, Ten CH. Disseminated intravascular coagulation. N Engl J Med 1999; 341 (8): 586-92.

4. Devine DV, Greenberg CS. Monoclonal antibody to fibrin D-dimer (DD-3B6) recognizes an epitope on the Y Chain of fragment D. Am J Clin Pathol 1988; 89: 663-66.
5. Carr JA, Mckinney M, McDonagh. Diagnosis of disseminated intravascular coagulation. Role of D-dimer. Am J clin Pathol 1989; 91:280-87.
6. Machin SJ. Acquired disorders of haemostasis. In Hoffbrand AV, Lewis SM (eds). Postgraduate Haematology 3rd ed. London. Heinmann profession publishing 1991; 655-671.
7. Yu-M, Nadrella-A, Pechet-L. Screening test of disseminated intravascular coagulation: guidline for rapid & specific laboratory diagnosis. Crit-Care-Med 2000; 28(6): 1777-80.
8. Rickles FR, Levine M, Edwards RL. Hemostatic alteration in cancer patients. cancer metastasis Rev. 1992; 11: 237.
9. Dacie SJV, Lewis SM. Practical haematology, 7th Ed. Edinburgh: ELSB, Churchill Livingstone, 2001:279-318.
10. Bland M. An introduction in Medical Statistics Ist Ed. Oxford University Press 1988: 165-87.
11. Francis CW, Marder VJ. Correlation of myocardial reperfusion after fibrinolytic therapy with detection of fibrin-specific derivatives in serum by application of an electrophoretic assay. Thromb Haemost 1985; 54:974.
12. Gordon LI, Kwaan HC. Thrombotic microangiopathy manifesting as thrombotic thrombocytopenic purpura/hemolytic uremic syndrome in the cancer patient. Semin Thromb Hemost. 1999; 25(2): 217-21.