BLOOD RESEARCH DIVISION

Deputy Director & Head	...	Dr. San San Htwe MBBS, MMedSc(Pathology)(UM 1)
Research Scientist	...	Dr. Min Min Win MBBS, MMedSc(Pathology)(UM1)
Research Officer	...	Daw Aye Mya Khine BSc(Maths)(UDE)
	...	Dr. Khin La Pyae Tun MBBS(UM1), MMedSc (Pathology)(UM2)
	...	Dr. Thitsar Htet Htet Htoo MBBS(UM2)
Research Assistant (2)	...	Daw Win Win Mar BSc(Chemistry)(YU)
	...	Daw Ni Ni Win BA(History)(UDE)
	...	Daw Aye Myint Oo BA(Economic)(YU)
Research Assistant (3)	...	Daw Aye Thandar Khine BA(Geography)(UDE)
	...	Daw Aye Thidar Saing BSc(Botany)(UM), PGDCA(YU)
	...	Daw Moe Thuzar Min BSc(Zoology)(UDE)

Blood Research Division is primarily involved in research studies on red cell disorders, diagnosis as well as management of common haematological malignancies, haemostasis and coagulation disorders to identify and solve the health problems related to hematological diseases and disorders. The clinical arm is further supported by the Clinical Research Unit on Haematology at Yangon Children's Hospital.

RESEARCH PROJECTS

1. NON-COMMUNICABLE DISEASE

1.1. HAEMATOLOGICAL DISORDER

1.1.1. Profile of lupus anticoagulant in women with preeclampsia

In Myanmar, preeclampsia is one of the leading causes of maternal morbidity and mortality. The presence of antiphospholipid antibodies such as lupus anticoagulant, anticardiolipin antibodies, anti beta2-glycoprotein I can cause a hypercoagulable state that causes thrombosis and obstetric complications (miscarriages, stillbirths and preeclampsia). The study is aimed to detect the presence of lupus anticoagulant positive in women with preeclampsia at Central Women Hospital. Fifty apparently normal women and 65 patients with preeclampsia before 34 weeks gestation with the age of 22 to 47 years were included. Lupus anticoagulant is tested by screening and followed by confirmation with Dilute Russel Viper Venom Test (dRVVT). The presence of lupus anticoagulant is indicated equal or greater than 1.8 of normalized ratio between screening and confirmation test. The test to determine the lupus anticoagulant was negative in all patients from both normal apparent women and preeclampsia women. We could not demonstrate the presence of lupus anticoagulant in preeclampsia in this study.

1.2. CANCER

1.2.1. The role of thrombocytosis in prognostic evaluation of epithelial ovarian tumors

Biopsy report, Ultra sonogram, tumor marker CA 125 level is a widely used method for detection of ovarian cancer. In Myanmar, there have been very limited resources and facilities to perform tumor marker CA 125 level testing. The research project was carried out at the Oncology Ward, Yangon Women Hospital, Yangon, Myanmar. A total of 57 newly diagnosed

ovarian cancer patients were included in this study. Preoperative platelets counts, CA 125 level and post operative findings in these patients were analyzed. Among the patients with normal platelets count, 82.1% (23/28) were found with high CA 125 level. Almost all patients with thrombocytosis (100%, 29/29) were found with high CA 125 level (p value= 0.023). According to post operative reports, metastasis were detected in 60.7% (17/28) patients with normal platelets count, and 89.7% (26/29) patients with thrombocytosis (p value= 0.01). Ascites were presented in 64.3% (18/28) patients with normal platelets count, and 86.2% (25/29) patients with thrombocytosis (p value= 0.06). The outcome of our study will be a great help in patients with ovarian cancer by identification of preoperative biological markers related to cancer aggressiveness and high risk individual who can be targeted for acute treatment.

1.2.2 Detection of serum HER-2/neu oncogene in breast cancer patients

Breast cancer is the most common cancer in women with both in the developed and less developed world. In recent years, the HER-2/neu oncoprotein has emerged as an important cellular target for the development of a variety of new cancer therapies. HER-2/neu positivity is associated with a poor prognosis (higher rate of recurrence and mortality) and usually associated with resistance to endocrine therapies. The aim of the study is to establish the diagnosis laboratory for detection of serum HER-2/neu oncogene in breast cancer patients and to find out the patients who can receive targeted therapy. The research study was carried out at the Medical Oncology Ward, Yangon General Hospital. A total of 61 newly diagnosed female breast cancer patients of ages between 29 to 78 years were included in this study. Serum HER-2/neu level in these patients was analyzed by enzyme linked immunosorbent assay (ELISA). Out of 61 patients, 3.3% (2/61) was found with In-situ (non-invasive) breast carcinoma and 96.7% (59/61) had invasive (infiltrative) breast carcinoma. Among the patients with invasive (infiltrative) breast carcinoma, 40.7% (24/59) was found with metastasis lymph nodes. Serum HER-2/neu was positive (more than 15.0 ng/ml) in 4.9% (3/61) and negative (less than 15.0 ng/ml) in 95.1% (58/61). All three patients (3/3,100%) with serum HER-2/neu positive results suffered from invasive (infiltrative) breast carcinoma and two of these patients (2/3, 66.7%) had metastasis lymph nodes. This is the first study in Myanmar of serum HER-2/neu detection in breast patients. This study has demonstrated that serum HER-2/neu testing should be used to assess the prognosis and suitability of targeted therapy in breast cancer patients in Myanmar.

1.2.3. Immunophenotypic analysis of acute leukemia by flow cytometry

Immunophenotyping is an essential for diagnosis and classification of acute leukemia and flow cytometry is the preferred method of immunophenotypic analysis. The study aims to establish the flow cytometry laboratory to detect the immunophenotypes of leukemic blast cells. It was a cross sectional descriptive study conducted at Yangon Children Hospital. Peripheral blood and/or bone marrow samples from 56 children with suspected acute leukemia were performed immunophenotyping using four color flow cytometry. A panel of 9 monoclonal antibodies: CD45, CD34, HLA-DR, CD3, CD7, CD10, CD19, CD13 and CD33 were used in the study. Among 56 samples studied, 13 cases were no evidence of leukemia and 43 cases were diagnosed as acute leukemia. Of the 13 samples proved to be non- leukemic were morphologically diagnosed as follows: 5 patients with lymphoma infiltration, 3 patients with haemodilute marrow, 3 patients with hypoplastic marrow and 2 patients with reactive marrow. Among 43 acute leukemia cases, 13 cases (30.2%) were acute myeloid leukemia (AML), 28 cases (65.1%) were acute lymphoblastic leukemia (ALL) but we could not differentiate between myeloid and lymphoid leukemia in 2 (4.7%) cases. Of 28 patients with acute lymphoblastic leukemia, 32.1% (9/28) were T-ALL and 67.9% (19/28) were B-ALL. Mediastinal mass was present in 22.2% (2/9) patients with T-ALL but absent in

B-ALL. Hyperleukocytosis was found to be more in T-ALL than B-ALL (66.6% vs. 15.7%, P value = 0.007). The results getting from the study was useful for clinical management therefore flow cytometry will need to be applied in routine diagnosis of acute leukemia in Myanmar.

1.2.4. Flow cytometry immunophenotyping in multiple myeloma

Immunophenotyping has become an invaluable tool in the management of hematological malignancies and is increasingly finding a role in the diagnosis and monitoring of plasma cell disorders. The aim of the study is to provide an accurate diagnosis of multiple myeloma by application of flow cytometry immunophenotyping. A cross sectional descriptive study was conducted at Department of Clinical Hematology, Yangon General Hospital. A total of 20 clinically suspected cases of multiple myeloma were included for the study. Age of the patients ranged from 54 years to 69 years. The male to female ratio was 1.5:1. Neoplastic plasma cells were determined by flow cytometry (PARTEC) CyFlow^{R} Space. Neoplastic plasma cells were defined as CD138+/ CD56 +or- / CD19-/ CD45variable or CD38+/ CD56 +or - / CD19-/ CD45variable. Serum protein electrophoresis and densitometer reading was performed for detection of monoclonal band and monoclonal protein concentration. Flow cytometry immunophenotyping was performed using monoclonal antibodies against CD56, CD19, CD138, CD38 and CD45. The plasma cells were initially identified using CD138 and side scatter, following which, CD138+ gated cells were analyzed for CD56, CD19 and CD45. In cases of CD138- specimens, bone marrow aspirate was restained with a CD56/CD19/CD38/CD45 panel. Among the 20 cases, 17 cases (85%) showed the expression of CD138+/ CD56 +/ CD19-/ CD45dim and was diagnosed as multiple myeloma. Serum protein electrophoresis was performed on cellulose acetate strip. M band was detected visually and estimation of M protein was done by densitometer. Among the 20 cases, 17 cases (85%) had monoclonal gammopathy. Among the 17 cases, 15 cases (88.24%) had the M band in the gamma (γ) region and 2 cases (11.76%) had it in the beta (β) globulin region. The mean concentration of the M protein was 4.67 g/dl, with a range of 3.15 to 6.36 g/dl. In conclusion, flow cytometry immunophenotyping is useful tool for the diagnosis of multiple myeloma and it should be included as a routine assay in monoclonal gammopathy patients.

1.2.5. Relationship between coagulation parameters and disease severity in patients with primary lung cancer attending at Medical Oncology Unit, Yangon General Hospital

The activation of coagulation and fibrinolysis is frequently encountered among cancer patients. Many studies have shown that activation of coagulation like prolonged prothrombin time, fibrinoginemia is associated with higher risk of invasion, metastasis and unfavorable impact. This study was carried out to find out the relationship between prothrombin time (PT), fibrinogen (F) level and histological type, TNM staging, other clinico-pathological variables in primary lung cancer patients. The study was conducted at Medical Oncology Unit, Yangon General Hospital. Within one month of the study period, total 10 cases of primary lung cancer had already been studied. Fibrinogenemia (>400 mg/dl) was found in 10% (1/10) patients and normal fibrinogen (150-400 mg/dl) in 90% (9/10) patients. All cases (100%) had normal prothrombin time. The study will be carried out to reach the sample size up to 114 cases.

SERVICES PROVIDED

ACEDEMIC

Sr.	Name	Course	Responsibility
1.	Dr. Win Pa Pa Naing	MMedSc (Pathology) MMed Tech (Medical Laboratory Technology) B. Med. Tech & M.Med.Tech (Military Institute of Nursing and Paramedical Science) Workshop on Research Methodology (2015)	Teaching Teaching Teaching Facilitator

LABORATORY

Paraprotein testing of (106) serum samples by serum protein electrophoresis.