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ABSTRACT BOOK

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ABSTRACT NO.: OP-269

Risk Prediction of Fever in Neutropenic Children with Acute Lymphoblastic Leukemia

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Key words: risk prediction, febrile neutropenia, acute lymphoblastic leukaemia

Introduction. Fever in severe chemotherapy induced neutropenic patients is the most frequent manifestation of a potentially lethal complication of current intensive chemotherapy regime. This study aimed at establishing model predicting the preventable risk of febrile neutropenia in patient of acute lymphoblastic leukemia.

Aim. Identification of risk factors of fever in neutropenic children with acute lymphoblastic leukemia.

Materials and methods. This descriptive observational study was carried in the department of pediatric hematology and oncology department during the period of 1st February 2013 to 31st January 2014. Through purposive sampling 40 neutropenic patients were selected. Their total history and behavioral pattern regarding the supportive management (neutropenic diet, use of aciflavine solution, nystatin oral solution, mouth wash with povidone iodine),total duration of hospital stay, duration of neutropenia, no of attendant during hospital stay were recorded. Blood, urine and wound swab culture was done. Nutritional assessment was done according to WHO malnutrition criteria.

Results. Most of the studied child was in induction phase of therapy. The mean hospital stay was 8.56 ± 6.75 days and mean no of attendant with each patient was 2.02 ± 0.65. Majority of the patient were on neutropenic diet and freshly cooked food (87.5 %). This study shows a large portion (52.5 %) of the studied population did not use acriflavine as per advice. It also revealed majority of the child did not use povidone iodine mouth wash (52.5 %) and nystatin (47.5 %) as per advice. A total of 10 patients (25 %) revealed growth of pathogens. Among them blood culture was positive in 4 patients, urine culture was positive in 3 patients and wound swab culture was positive in 3 patients. This study showed that major portion (65 %) of the febrile neutropenic child suffered from malnutrition.

Conclusion. This study showed that majority of the patient did not properly follow the advice regarding behavioral and supportive management. Duration of hospital stay stay and no of attendant were also high. Malnutrition was present in a large portion of the child. So a large scale multicentre cohort study should be done to validate these finding before establishing as risks.

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Gene expression-based classification and risk stratification of pediatric acute lymphoblastic leukemia

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Key words: acute lymphoblastic leukemia, gene expression, classification, prognosis

Introduction. Acute lymphoblastic leukemia is the most common childhood tumor and remains a leading cause of cancer death in the young. It contains cytogenetically distinct subtypes that respond differently to cytotoxic drugs. Previously, we developed a microarray-based subtype classifier based on the relative expression levels of 62 marker genes, and furthermore adopted an advanced fragment analysis (AFA) technique to detect that maker genes, the accuracy of this AFA-based classification attained more than 94 %. Compared to microarray assays, this technique makes the convenient, low cost and individualized subtype diagnosis of pediatric ALL a reality and is clinically applicable. However, the prognosis value of this AFA-based classification compare to traditional MICM classification is still unknown.

Aim. To clear the prognostic significance of AFA-based gene expression classification.

Materials and methods. From August 2007 to January 2014, 188 children aged between 9 months and 13 years (median age of 5 years) with newly diagnosed ALL were enrolled in this study. All patients were diagnosed with ALL using a combination of MICM classifications and were treated according to the Beijing Children's Hospital (BCH) ALL 2003 protocol or Chinese Children's Leukemia Group (CCLG) ALL 2008 protocol. The classification of 188 ALL cases according to MICM subtype and the corresponding risk stratification group are shown in table 1.

We chose January 1, 2016 as the end of collection of the patients' treatment outcomes. Event-free survival (EFS) was defined as the time from the diagnostic date to the date of the induction failure, relapse, gave up, death caused by any reasons, or second tumor, whichever came first, or the last contact with patients in continuous CR. Kaplan–Meier survival curves were used to determine the differences in EFS between the patients with MICM and AFA classification. Survival rates were calculated and compared using Kaplan–Meier methods, log-rank tests, and Cox regression models (univariate and multivariate analyses). Due to the investigative nature of this analysis, all tests were conducted at the 1 % significance level. All analyses were performed using SPSS 16.0 (IBM, Armonk, NY, USA).

Results. We constructed a classier based on 240 published ALL microarray data and tested it on the 188 independent AFA samples. The accuracy of this cross platform prediction is more than 94 % and the detail information of each subtype is shown below.

With the AFA-based gene expression profiling classification, 61.2 % (115/188) of patients were classified as Standard risk group (SRG), 15.4 % (29/188) as High risk group (HRG) and the others 23.4 % (44/188) as Intermediate risk group (IRG). The new classification showed tiny disparity with the distribution of clinically assigned risk groups (the percentages in clinical SRG, HRG and IRG were 71.3 %, 11.1 % and 17.6 %, respectively) ($P > 0.05$). The 5-year EFS for SR, IR and HR according to the new risk group stratification were 94.3 ± 3.3 %, 67.1 ± 7.8 % and 48.3 ± 9.3 %, respectively, as compared to 92.9 ± 3.1 %, 66.3 ± 9.0 % and 28.6 ± 9.9 % ($P > 0.05$) according to the original clinical stratification.

Conclusion. Despite AFA-based gene expression profiling classification with high accuracy, so far its prognostic value is not superior to the traditional MICM classification. We will enlarge the sample to validate its accuracy and follow-up all the patients to further observe its prognostic value.