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DOI: 10.1159/000366080**Peripherally Inserted Central Catheter: How Safe Is It for Acute Myeloid Leukemia Patients?**Jingran Zhou<sup>a</sup>, Min Li<sup>b</sup>, Zhenyu Tang<sup>b</sup>Departments of <sup>a</sup>Hematology and <sup>b</sup>Neurology, Second Affiliated Hospital of Nanchang University, Nanchang, PR China

Dear Editor,

Safe and reliable vascular access is essential for the treatment of patients with acute myeloid leukemia (AML). During the past decade, a systematic exploration of the countless barriers to achieve this goal has been undertaken. The use of indwelling central venous catheters (CVCs) has significantly enhanced the administration of drugs to AML patients [1]. Clearly, the maintenance of long-term intravenous routes is one critical element minimizing CVC-related complications (such as infection, fibrin sheath formation and thrombosis) [2].

A peripherally inserted central catheter (PICC) may help eliminate potentially life-threatening complications (e.g., hemothorax). It provides an alternative to subclavian or jugular vein catheterization and reduces the likelihood of arterial puncture and hemorrhage [3]. In addition, it is deemed a relatively simpler, safer and easier alternative to central venous routes [2]. The number of PICC placements in the USA, for example, has been estimated to over a million per year [4]. The most obvious advantage of PICC is its long-term dwell time for long-term antibiotic administration to prevent CVC-related infections [5]. However, this is a double-edged sword. A catheter-related infection results in a cost increase of USD 6,000 per treatment because of prolonged hospitalization by on average 7 days [6]. This creates a modern-day health burden. Although PICCs for cancer patients have been used for many years, few data are available on patients affected with AML.

Interestingly, a prospective study by Karthaus et al. [7] found that the incidence of CVC-related infections was low in patients with acute leukemia undergoing intensive chemotherapy. The authors observed the frequency of localized infection at the insertion site of all the patients (n = 58) treated for acute leukemia. Catheters were inserted into the subclavian or jugular vein. Although the overall incidence of CVC infections in acute leukemia patients was only 6.5 per 1,000 catheter days, the criterion for the diagnosis of intravascular catheter-related infections was the roll plate method. In 2001, the guidelines by Mermel et al. [8] reported that the roll plate method will be quite sensitive in the identification of a recently inserted catheter (duration of placement <1 week). However, in the trial of Karthaus et al. [7], the catheters remained in place for a mean of 14.5 days (>1 week), i.e. the roll plate method was less sensitive. Therefore, the results of this trial need to be interpreted with caution, mainly because of its limitation in diagnostic technique.

In AML patients, the difficulty associated with the reinsertion of a CVC may result in a decision that could increase the risks of

catheter-related local infection. A retrospective study by Strahilevitz et al. [9] evaluated the associated complications and their significance with regard to catheter removal. Fifty-two PICCs were inserted in 40 patients with AML. This study demonstrated that PICC provided effective long-term vascular access in patients with AML. As the authors acknowledged, their study had several limitations. First, it was a retrospective study. It could only demonstrate that PICC provided long-term vascular access with a relatively low complication rate, but could not prove a potential for error in the reporting of complications (e.g., infections, phlebitis and others). Second, at present, it is difficult to compare the complication rate among different series because the definitions and diagnostic techniques of complications vary [8].

How safe is PICC for AML patients? In conclusion, a strong body of evidence has shown that PICC provided long-term vascular access with an acceptable complication rate in patients with AML. Future studies, preferably randomized trials comparing PICCs with other catheters, are required, and the following potential measures should be considered: (1) Using a smaller-diameter PICC may reduce vascular damage; meanwhile, it is plausible that antibiotic-impregnated surfaces of the catheter may reduce the rate of infectious complications [10]. (2) Rapid diagnostic techniques and unified definitions of complications are warranted to determine whether or not PICC can be considered an acceptable catheter for AML patients. (3) Prospective clinical trials could explore whether the use of PICC may decrease the rate of complications.

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