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Continuing Medical Education (CME) Questions

Oncogenetics and MRD in pediatric T-ALL

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Petit A, Trinquand A, Chevret S, Ballerini P, Cayuela J-M, Grardel N, Touzart A, Brethon B, Lapillonne H, Schmitt C, Thouvenin S, Michel G, Preudhomme C, Soulier J, Landman-Parker J, Leverger G, Macintyre E, Baruchel A, Asnafi V, on behalf of the French Acute Lymphoblastic Leukemia Study Group (FRALLE). Oncogenetic mutations combined with MRD improve outcome prediction in pediatric T-cell acute lymphoblastic leukemia. *Blood*. 2018;131(3):289-300.

1. **Your patient is a 7-year-old boy with T-cell acute lymphoblastic leukemia (T-ALL). In the retrospective study by Petit and colleagues, which of the following statements about oncogenetic low-risk (gLoR) vs oncogenetic high-risk (gHiR) patients with childhood T-ALL is correct?**
   - ☐ Three-quarters of patients were classified as gLoR
   - ☐ In patients with *NOTCH1/FBXW7* mutations, *RAS/PTEN* alteration was associated with better outcomes
   - ☐ Five-year cumulative incidence of relapse (CIR) and disease-free survival were, respectively, 36% and 60% for gHiR patients vs 11% and 89% for gLoR patients
   - ☐ Among patients with minimal residual disease (MRD) of $<10^{-4}$, the 5-year CIR did not differ between gHiR and gLoR patients

2. **In the retrospective study by Petit and colleagues, which of the following statements about outcome prediction for patients with childhood T-ALL based on a combination of oncogenetic classifier, MRD, and other factors is correct?**
   - ☐ Multivariable Cox models and stepwise selection showed that the 3 most discriminating variables were the oncogenetic classifier, MRD, and male sex
   - ☐ Five-year CIR was 46% in patients with a white blood cell (WBC) count of 200 × 10^9/L or higher, gHiR classifier, and MRD of $>10^{-4}$ vs 2% in those with a WBC count of <200 × 10^9/L, gLoR classifier, and MRD of $<10^{-4}$
   - ☐ Among high-risk patients with MRD of 10^{-4} or higher, gHiR status did not further negatively affect outcome
   - ☐ Among patients with MRD of $<10^{-4}$, the oncogenetic classifier did not add to prediction of leukemia-related death

3. **In the retrospective study by Petit and colleagues, which of the following statements about clinical implications of these findings regarding outcome prediction for patients with childhood T-ALL based on a combination of oncogenetic classifier, MRD, and WBC count is correct?**
   - ☐ Oncogenetic markers, MRD, and WBC count are independent outcome predictors and should be used together for individual treatment stratification
   - ☐ *NOTCH/FBXW7/RAS/PTEN* mutation profile combined with MRD and WBC count of 200 × 10^9/L or higher identified 60% of patients who had low risk for relapse
   - ☐ Previous studies also showed that a WBC count of 200 × 10^9/L or higher was associated with better outcomes
   - ☐ The researchers propose prospective testing of a pediatric T-ALL stratification based on WBC, MRD, and a 3-gene oncogenetic classifier

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