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# Prospective validation of the provisional entity of refractory cytopenia of childhood, proposed by the World Health Organization

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## Summary

In 2008, the World Health Organization proposed a new entity of childhood myelodysplastic syndrome (MDS), which was referred to as refractory cytopenia of childhood (RCC). However, whether this morphological classification reflects clinical outcomes remains unclear. We performed a prospective evaluation of bone marrow morphology in 252 children with acquired bone marrow failure between 2009 and 2013. Of 252 patients, 63 were diagnosed with aplastic anaemia (AA), 131 with RCC without multilineage dysplasia (RCC-w/o-MLD) and 58 with RCC with MLD (RCC-MLD). One patient with AA, three with RCC-w/o-MLD and nine with RCC-MLD presented with chromosomal abnormalities at diagnosis ($P$ = 0·001). The response rates to immunosuppressive therapy (IST) at 6 months and the cumulative incidence of clonal evolution at 5 years did not significantly differ among the three groups. A multivariate analysis revealed that the morphological classification of RCC-MLD was a significant risk factor for secondary graft failure after haematopoietic cell transplantation (HCT) ($P$ = 0·003). In view of these findings, RCC could be divided into two categories, RCC-w/o-MLD and RCC-MLD, because children with this condition exhibited a distinct morphology, frequent chromosomal abnormalities at diagnosis and a high frequency of secondary graft failure after HCT.

**Keywords:** refractory cytopenia of childhood, aplastic anaemia, myelodysplastic syndrome with multilineage dysplasia, acquired bone marrow failure, children.



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