J Appl Genet. 2016 Feb;57(1):63-9.
doi: 10.1007/s13353-015-0295-4. Epub 2015 Jun 12.

Comparison of two subtelomeric assays for the screening of chromosomal rearrangements: analysis of 383 patients, literature review and further recommendations.

Lorena Santa María, Víctor Faundes , Bianca Curotto, Paulina Morales, Karla Morales, Solange Aliaga, Ángela Pugin, María Angélica Alliende

Abstract

Intellectual disability (ID) and global development delay (GDD) are caused by genetic factors such as subtelomeric rearrangements (SR) in 25 % of patients. There are several assays currently available to detect SR, but subtelomeric fluorescence in situ hybridisation (Subt-FISH) and subtelomeric multiplex ligation-dependent probe amplification (Subt-MLPA) have been the most frequently used. However, the diagnostic yield of each technique has not been compared. We reviewed the results of SR screening over a ten-year period in Chilean patients with ID/GDD using Subt-FISH and/or Subt-MLPA, compared the diagnostic yield of both tools and reviewed the corresponding literature. A total of 383 cases were included in this study, of which 53.8 % were males. The overall diagnostic yield was 8.9 % between both methods, but Subt-MLPA showed a higher performance than Subt-FISH ($p = 0.002$). A total of 4,181 patients with ID/GDD have been studied worldwide with Subt-MLPA and other subtelomeric assays, and 244 (5.84 %) had a pathogenic SR. It is estimated that Subt-MLPA may detect 92.6 % of the total cases with SR. The capacity of detecting tandem duplication and other critical regions, as well as the use of two MLPA kits, may explain the higher performance of this tool over Subt-FISH. Therefore, we recommend the use of this subtelomeric method as a cost-effective way to study ID/GDD patients.