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SHORT TANDEM REPEAT (STR) ANALYSIS OF CHIMERISM IN ALLOGENEIC PERIPHERAL BLOOD STEM CELL TRANSPLANT IN UKMMC KUALA LUMPUR.

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Background:

Detection of the degree of chimeras after transplantation is important to determine whether engraftment is successful. Short tandem repeats (STR) analysis is an approach that can give reproducible informative data. We have used a commercial multiplex STR-PCR assay to evaluate the chimerism status in patients with allogeneic peripheral blood stem cell transplantation (PBSCT) in UKMMC.

Materials and Methods:

Whole peripheral blood samples were collected in 3ml EDTA from donor and recipient before transplantation in order to determine the informative locus. Samples of recipients during post-transplant periods were collected on days 30, 60, 100 and 180 and every three months to monitor the engraftment. Extraction of DNA was done using QIAamp[®] DNA Blood Mini Kit (Qiagen, USA), and DNA concentration and purity was evaluated by Nanovue spectrophotometer. DNA amplification using AmpFISTR Identifiler Kit (Applied Biosystem) consisting of 15 STR loci plus amelogenin marker was carried out using the GeneAmp PCR System 9700 (ABI Prism). Fragment analysis of the PCR product was performed on the Genetic Analyzer 3130 (Applied Biosystem) and quantitation of the proportion of recipient/donor cells was determined by Genemapper V4.0 software. We analyzed the genetic profiles of each recipient/donor pair at pre-transplant as well as the genetic profiles of the recipients at post-transplant to determine the chimerism status.

Results:

A total of 30 cases of allogeneic (PBSCT) were analyzed by this method. The chimerism status, either complete, partially or mixed chimerism from the distribution of informative donors and recipients were successfully determined for all the cases.

Conclusion:

In conclusion, the STR-PCR assay gives quantitative information with low variability and high reproducibility, and has provided relevant clinical information of the PBSCT cases in our hospital.

Keywords:

Short tandem repeat (STR), donor chimerism, allogeneic PBSCT