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Common occurrence of *PIK3CA* and *PTEN* mutations but not LPA4 mutations in pediatric and adult differentiated thyroid cancer

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Thyroid cancer is the most common endocrine malignancy. In the past 4 decades, the incidence of thyroid cancer is consistently increasing in all parts of the world. Recently, mutations in the genes of GPCR signaling pathway were reported in thyroid cancer patients of mixed ages. However, the prevalence of mutations of the GPCR signaling pathway genes its significance is completely unknown in pure pediatric and adult DTCs. In this study, we determine the prevalence of the GPCR pathway genes (*LPAR4*, *PIK3CA* and *PTEN*) mutation in pure pediatric and adult DTCs. A total of 310 samples consisting of 17 multi nodular goiters (MNG), 89 pediatric (age < 18 years) and 204 adult (age > 18 years) DTC samples were analyzed for mutations in genes *LPAR4* (exon 1), *PIK3CA* (exons 9 and 20) and *PTEN* (exons 5, 6, 7 and 8) of the GPCR pathway by PCR amplification of tumor genomic DNAs and direct sequencing of amplicons using Sanger sequencing. Overall, we found 2.7% (2/72) of *PIK3CA* and 1.4% (1/72) of *PTEN* in pediatric CPTC (classical papillary thyroid cancer). We identified 3.6% (2/55) of *PIK3CA* in FV-PTC (Follicular Variant PTC), 3.5% (1/29) of *PIK3CA* in TPC (Tall-cell PTC), and 1% (1/114) in CPTC of adult thyroid cancer. We did not find any mutations in *LPAR4* gene in both pediatric and adult thyroid cancer. We also found two novel mutations one in the PIK3CA gene (C984Y) of a pediatric CPTC and the other in the *PTEN* gene of an adult CPTC sample. Our study is the first to report *GPCR* pathway mutations in a pure and adult DTC samples. Our results show a common occurrence of *PIK3CA* and *PTEN* mutations but not the *LPAR4* mutations in both pediatric and adult DTCs suggest *PIK3CA* and *PTEN* genes of the GPCR pathway play a significant role in thyroid carcinogenesis and pave attractive target for therapeutic prevention.

Biography

Murugan Avaniyapuram Kannan completed his PhD from the Department of Molecular Oncology, Tokyo Medical and Dental University, Tokyo, Japan and Postdoctoral studies from Hoshi University, Tokyo, Japan and The Johns Hopkins University School of Medicine, Baltimore, USA. Currently, he is a Scientist in the Department of Molecular Oncology, King Faisal Specialist Hospital & Research Center, Riyadh, Saudi Arabia. He has published more than 35 papers in reputed journals and holds a patent for identification of novel ALK mutations in anaplastic thyroid cancer. His research focuses on molecular biology of head and neck squamous cell carcinoma and thyroid cancer identifying molecular therapeutic targets and biomarkers. He has been serving as Reviewer in *Thyroid, PLOS One, Oncogene, Cancer Research, Tumor Biology, Endocrine Related Cancer, Oral Oncology*, etc.

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