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TRIUMPH Trial: One Small Step Could Become One Giant Leap for Precision Oncology in Head and Neck Cancer

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Recent remarkable progress in the fields of cancer genomics, computational analysis and drug discovery have changed the whole paradigm in cancer research. So called precision oncology, defined as molecular profiling of tumors to identify druggable alterations, is rapidly developing and waiting for entering the mainstream of cancer research as well as practice [1]. In the era of precision oncology, traditional classification based on organ or pathology do not have clinical meaning anymore. Molecular subtype base on next-generation sequencing (NGS) will lead us to appropriate molecular targeted agents.

Head and neck squamous cell carcinoma (HNSCC) is not a specific disease entity, but rather a broad category of diverse tumor types arising from various anatomic structures including oral cavity, oropharynx, hypopharynx, larynx and paranasal sinus. HNSCC is highly heterogeneous group of disease arises from the mucosal lining of the upper aerodigestive tract, demonstrates squamous differentiation, and involves older men with a long history of smoking. The prognosis by anatomic subsite quite differ. Human papilloma virus positive oropharyngeal cancer showed very good prognosis while oral cavity cancer had worst prognosis. In the era of NGS, HNSCC become more heterogeneous by mutational status [2-4].

Traditional design of clinical trials has faced big challenge for these heterogeneity and rarity. One solution is umbrella trial. In an umbrella trial, patients with specified cancer type are centrally screened and assigned to one of several molecularly defined subtrials where they receive matched targeted agents [5]. Some novel umbrella trials such as BATTLE trial [6] or MOSCATO trial [7] suggest that such a biomarker driven clinical trial can give appropriate benefit to the patients. To perform an umbrella trial, precise NGS based molecular phenotyping should be practical and working in the level of clinic. To date, there was surprisingly few study deals with the feasibility of molecular phenotyping for umbrella trial. We should answer the questions whether precision oncology is just a theory or whether it is realistically feasible. We should answer how we implement the precision oncology into the clinic and prove the patients' benefit.

In this issue of *Cancer Research and Treatment*, Lim et al. [8] reported the feasibility of targeted NGS to guide the treatment of HNSCC. The authors tested the feasibility from tissue sample process to analysis of NGS and mRNA expression at the practical level. Mutation profiles were similar with prior reports [2-4] and the authors found several targetable alterations such as *PIK3CA*, *CDKN2A* and *CCND1*.

Based on this success, KCSG (Korean Cancer Study Group) Head and Neck Cancer and Esophageal Cancer Committee launched novel umbrella trial: Translational bIomarker Driven UMbrella Project for Head and Neck (TRIUMPH, NCT 03292250), which is the first umbrella trial for HNSCC in the world. TRIUMPH trial is for recurred/metastatic HNSCC, consisting of 5 targeted therapies including phosphoinositide 3-kinase inhibitor BYL719, pan-HER inhibitor poziotinib, fibroblast growth factor receptor inhibitor nintedanib, CDK4/6 inhibitor abemaciclib, andd immune checkpoint inhibitor durvalumab+/− tremelimumab. TRIUMPH trial is investigator-initiated trial, and Korean Cancer Study Group affiliated 37 institutes participate. We think TRIUMPH trial is one small step for head and neck cancer, but hope to be one giant leap for precision oncology in HNSCC.

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