1012

Implementation of Genetic Counseling and Genetic Testing in a Pulmonary Hypertension Comprehensive Care Center

McDevitt SE, Arscott P, Aatre R, Visovatti S, Knight C, McLaughlin V
University of Michigan, Ann Arbor, MI

Purpose: To demonstrate the development and feasibility of implementing Genetic Counseling and Genetic Testing in a PH CCC.

Background: Since the identification of mutations in the BMPR2 gene in PAH patients, several other genes have been implicated. It is estimated that 25-30% of IPAH should be classified as HPAH. BMPR2 mutations may explain 70-80% of PAH in heritable cases, and 10-20% of IPAH. Recent expert consensus recommendations emphasize a medicolegal obligation to inform all patients with IPAH/HPAH, anorexigen-associated PAH, PVOD/PCH, and in children with IPAH and CHD-PAH about the possibility of a genetic condition, for consideration of screening and early diagnosis. Genetic counseling should be performed prior to genetic testing, to educate on incomplete penetrance, surveillance, reproductive questions, genetic discrimination and psychosocial issues.

Methods: Two genetic counselors specialized in Cardiovascular Medicine were identified and educated in the field of PH. Clinical laboratories were identified that offer testing for relevant genes (BMPR2, EIF2AK4, TBX4, ATP13A3, GDF2, SOX17, AQP1, ACVRL1, SMAD9, ENG, KCNK3, CAV1, SMAD4, SMAD1, KLF2, BMPR1B, KCNA5). A specific referral for genetic counseling was created in the electronic medical record, along with process to confirm insurance approval/cost prior to implementation. Ideal timing of referral was determined to be after confirmatory diagnostic right heart catheterization and within the first few months of treatment. Verbiage was disseminated to the PH Program team for consistency when introducing the concept.

“Genetic counseling services are available for Pulmonary Hypertension patients in the Cardiovascular Center. There have been numerous identified genetic mutations in Pulmonary Arterial Hypertension. Variations in genes may increase the risk of developing pulmonary arterial hypertension, or alter the course of the disease potentially impacting the severity. Learning if you have a genetic abnormality may provide information to guide your future care as well as potential screening of your family members.” Also included was facility-specific information about the logistics of the genetic counseling appointment including time, cost, and insurance coverage, as well as a general statement about the cost and coverage for genetic testing.

Results: Since implementation in April 2018, a total of 16 patients (13 females, 3 males) to date have undergone genetic counseling. Diagnoses included HPAH (3), IPAH (5), and PVOD (8). Eight patients had negative genetic testing (2 HPAH, 1 IPAH, and 4 PVOD). Four patients had genetic variants identified in BMPR2 (2 pathogenic, 2 variants of unknown significance). Four patients declined genetic testing due to cost. Approximately five additional patients declined genetic counseling.

Conclusion: Despite significant advances, understanding of genetic mutations remains in the early stages. Opportunities exist to advance understanding of the basic molecular pathogenesis of HPAH, to identify additional genes and pathways that impact the pathobiology of PAH, and to discover genes that may be responsible for therapeutic response in PAH. These initiatives may facilitate prediction of prognosis and future prevention strategies. Developing a Genetic Counseling and Testing program at a PH CCC is feasible and recommended.