Young Age Does Not Equal Low Risk for Patients Needing Aortic Valve Replacement

NEW ORLEANS, Louisiana (Jan. 27, 2020) - While transcatheter aortic valve replacement (TAVR) continues to expand its pool of eligible patients, open heart surgery -- resulting in excellent patient survival and fewer strokes when compared to TAVR -- is the best option for young and middle-aged adults with aoortic valve disease -- at least for now, according to a scientific presentation at the 56th Annual Meeting of The Society of Thoracic Surgeons.

"Our research favors the use of surgical aortic valve replacement (SAVR) in adults who are younger than 55 years old," said Jennifer S. Nelson, MD, from Nemours Children's Hospital in Orlando, Florida. "Although young and middle-aged TAVR candidates do exist, thoughtful patient selection is critical to optimizing triage to SAVR and TAVR."

> *"When handled thoughtfully and responsibly, technological advances such as TAVR can help patients lead longer and fuller lives. As a congenital cardiac surgeon, I seek to define which patients will benefit the most from this new therapy and which patients are better served with other modalities," said Dr. Jennifer S. Nelson*

Using the STS National Database, Dr. Nelson and colleagues from Nemours and the Cleveland Clinic in Ohio examined data from patients who were 18 to 54 years old and received aortic valve replacement (SAVR or TAVR) between 2013 and 2018. Approximately one-sixth of these patients had congenital (present from birth) heart disease (CHD). As a result, researchers combined data from two components of the Database: the STS Adult Cardiac Surgery Database (ACSD) and the STS Congenital Heart Surgery Database (CHSD).

Overall, 1,580 unique CHSD and 44,173 ACSD operations were analyzed, and more than 15% of the operations were related to CHD. When isolated SAVR (no other complex operations were performed at the same time as the aortic valve replacement) was compared to isolated TAVR, the stroke rate was 0.9% versus 2.4%, respectively. The researchers also found that the 30-day mortality rate was slightly better for isolated SAVR than for isolated TAVR—1.9% versus 2.9%.

TAVR had an advantage over SAVR, though, when the researchers looked at the length of hospital stay: SAVR was longer at 6 days versus 4 days for TAVR (with the length of stay for TAVR expected to continue decreasing). This is especially noteworthy because the number of young and middle-aged adult TAVR candidates is increasing, with TAVR becoming more appealing to younger patients who want to minimize downtime and risks, according to Dr. Nelson. “The wisdom of extending TAVR to a younger adult population that mirrors the characteristics of an older population with acquired aortic valve stenosis may be reasonable,” she said.

Dr. Nelson explained that there also are challenges associated with TAVR in younger patients. Most concerning is that little is known about long-term valve durability, and so only time will tell how the latest devices fare as TAVR use is expanded into this group. The researchers also found that patients in this study most often had aortic insufficiency (leakage of the aortic valve) rather than aortic stenosis (narrowing of the valve)—the condition for which TAVR valves currently are approved. Therefore, many younger patients may have a type of valve disease that is “not amenable” to treatment currently available for TAVR, explained Dr. Nelson.

“However, as the durability of these valves and the benefits in other types of valve dysfunction become known through longer-term follow up, I expect the TAVR trend will continue toward younger and younger patients,” she said.

In addition, caution should be exercised in the application of TAVR to adult patients with CHD. According to Dr. Nelson, TAVR has been used only rarely in young adults and even less in adults with CHD. “Adults with CHD is a large and growing subgroup, but the anatomy of the aorta, aortic valve, and coronary arteries could present challenges for current TAVR devices. However, adults with CHD often have undergone several procedures in their lifetimes, so we must evaluate new therapies that could potentially avoid open, invasive operations. Further study is needed,” she added.

Dr. Nelson recognized TAVR as a “disruptive technology” that has changed the way adult cardiac surgery is practiced. “When handled thoughtfully and responsibly, technological advances such as TAVR can help patients lead longer and fuller lives. As a congenital cardiac surgeon, I seek to define which patients will benefit the most from this new therapy and which patients are better served with other modalities,” she said.

“Despite the excellent results and less invasive nature of TAVR in older adults, we need to exercise caution before offering this technology to younger patients,” said Robbin Cohen, MD, MMM, professor of surgery at the Keck School of Medicine of the University of Southern California in Los Angeles, who was not directly involved with this research. “We just don’t know enough about the durability of TAVR in young patients, nor do we know what the best treatment option will be should TAVR valves fail from structural deterioration and need to be replaced.”

The heart team approach, including an emphasis on shared decision-making and new collaborations between congenital and adult cardiac surgeons, has become especially important as the number of aortic valve replacement options increases,

according to Dr. Nelson. When cardiologists and cardiac surgeons together evaluate aortic valve disease cases, patients receive comprehensive counseling and invaluable insight into all of the viable options for their valve choice, allowing them to make more informed decisions.

“Because each patient is an individual with unique characteristics, deciding on the best valve option means considering the whole picture,” said Dr. Nelson. “Taking the time to learn about the risks and benefits of each valve option and sharing in the decision-making process with the heart team is the best way to make the right choice.”

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The other authors of the study were TM Maul, PD Wearden, HK Najm, O Baloglu, DR Johnston, and T Karamlou.

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Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 7,500 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society’s mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy.

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