POEMs

Patient-Oriented Evidence That Matters

Third Pfizer Vaccine Dose Significantly Increases Protection Against Mild and Severe COVID-19 in Patients 60 Years and Older

Clinical Question

To what extent does a third dose of the Pfizer-BioNTech vaccine protect against symptomatic illness and hospitalization from COVID-19 in patients 60 years and older?

Bottom Line

A third booster dose of the Pfizer-BioNTech mRNA vaccine against COVID-19 provides a large increase in protection for people 60 years and older against mild and severe infection. The protection against mild infection could help reduce community spread and reduce the incidence of long COVID in some infected patients. (Level of Evidence = 2c)

Synopsis

Israel had vaccinated one-half of its population by the end of March 2021 and began to roll out vaccine boosters in July because of concerns over waning immunity. One study looked at the period from July 30 to August 30, 2021, using data from a government health registry with information about vaccination status, age, demographics, hospitalizations, and COVID-19 infections. The authors identified 1,137,804 people 60 years and older who had not been previously infected with COVID-19 and who were in the country (Israel) in August. They compared the rates of any severity of COVID-19 infection in those who had received the booster with those who had not. They used a Poisson regression to adjust for age, sex, demographics, and the date of the patient's second vaccine dose. They found that the risk of any infection was much higher (adjusted risk ratio = 11.3; 95% CI, 10.4 to 12.3), as was the risk of severe infection (adjusted risk ratio = 19.5; 95% CI, 12.9 to 29.5), in the group who did not receive a vaccine booster. There was no added protection in the first week after the booster; the protection rose to substantial levels approximately 12 to 16 days after the booster was received. A limitation of the study was that care-seeking behavior may have differed between groups. This is accounted for in the test-negative control strategy used for most studies of vaccine efficacy, but that was not possible with this dataset. The duration of follow-up was less than a month, so durability remains unknown.

Study design: Cohort (retrospective)

Funding source: Unknown/not stated

Setting: Population-based

Reference: *Bar-On YM, Goldberg Y, Mandel M, et al. Protection of BNT162b2 vaccine booster against Covid-19 in Israel.* N Engl J Med. *2021;385(15):1393-1400.*

Mark H. Ebell, MD, MS
Professor
University of Georgia
Athens, Ga.

Some Nonpharmacologic Treatments May Decrease Migraine Frequency in Children and Adolescents

Clinical Question

Are nonpharmacologic treatments effective in decreasing migraine frequency in children and adolescents?

Bottom Line

Active nonpharmacologic treatments such as biofeedback, relaxation techniques, and general or specific psychological support (e.g., cognitive behavior therapy) may be a good place to start when trying to decrease migraine frequency in children and adolescents. The research is positive, although there is not much out there. (Level of Evidence = 1a-)

Synopsis

The researchers conducted this meta-analysis following PRISMA criteria, searching four databases, including the Cochrane CENTRAL and a previous systematic review. The articles were selected by five coauthors, and two authors evaluated studies for risk of bias. They identified 12 randomized controlled studies of 576 children and adolescents exposed to at least one nonpharmacologic treatment for the prevention of migraine with or without aura. Most studies were small, of short duration,

and had a moderate risk of bias. Combined with network meta-analysis, these limitations are a cause for concern about the direct comparisons of the interventions. Compared with no treatment (being on a waiting list), biofeedback, relaxation, self-administered psychological treatment (e.g., written or audio strategies for coping and relaxation), psychological placebo (e.g., one-hour sessions not specifically aimed at migraine treatment), and psychological treatments (e.g., cognitive behavior therapy) decreased the number of migraine days, frequency of attacks, or headache index. These differences were still present after at least three months. The typical difference (effect size) was small for long-term psychological placebos and medium for self-administered treatments. There was no evidence of publication bias, which might have been difficult to find given the small numbers of studies. Heterogeneity was reported but not discussed in detail.

Study design: Meta-analysis (randomized controlled trials)

Funding source: Government

Setting: Outpatient (any)

Reference: *Koechlin H, Kossowsky J, Lam TL, et al. Nonpharmacological interventions for pediatric migraine: a network meta-analysis.* Pediatrics. *2021;147(4):e20194107.*

Allen F. Shaughnessy, PharmD, MMedEd
Professor of Family Medicine
Tufts University
Boston, Mass.

Ultrasonography Is Accurate for Diagnosing Upper Extremity Fractures in Children

Clinical Question

How accurate is ultrasonography for diagnosing upper extremity fractures in children?

Bottom Line

Diagnostic ultrasonography is highly accurate for diagnosing most upper extremity fractures but slightly less accurate for fractures involving the elbow. Clinicians should not use ultrasonography alone to rule in elbow fractures in children. (Level of Evidence = 1a–)

Synopsis

The authors searched PubMed, EMBASE, and the Web of Science to find studies that compared diagnostic ultrasonography with an external reference standard to diagnose upper extremity fractures in children. The included studies used various reference standards: plain radiography, magnetic resonance imaging, bone scan, and clinical diagnosis. Two of the authors independently evaluated articles for inclusion and assessed the methodologic quality of the included studies. They resolved discrepancies through consensus and third-party adjudication if consensus could not be reached. They wound up with 32 studies with 2,994 children; 27 were prospective studies. Seven studies used radiology-based ultrasonography, and 17 used point-of-care ultrasonography. Nineteen studies took place in the emergency department. The studies were of mixed quality. Several studies did not describe the setting, the training of those performing the ultrasonography, or even the ages of the participants. Ultrasonography was 98% accurate based on the area under receiver operating characteristic curve. The sensitivity and specificity were high (95% for each); the positive likelihood ratio (LR+) was 21.1 (95% CI, 10.8 to 41.5), and the negative likelihood ratio (LR–) was 0.05 (95% CI, 0.03 to 0.07). Ultrasonography was very good at ruling in and ruling out fractures. When the authors looked at elbow fractures, ultrasonography was 96% accurate with high sensitivity (0.95) but slightly lower specificity (0.87). For fractures involving the elbow, ultrasonography was less accurate at ruling in fractures (LR+ = 7.3; 95% CI, 3.7 to 14.4) but was still accurate at ruling them out (LR– = 0.06; 95% CI, 0.02 to 0.16). The authors report high levels of heterogeneity in the data.

Study design: Meta-analysis (other)

Funding source: Self-funded or unfunded

Setting: Various (meta-analysis)

Reference: *Tsou P-Y, Ma Y-K, Wang Y-H, et al. Diagnostic accuracy of ultrasound for upper extremity fractures in children: a systematic review and meta-analysis.* Am J Emerg Med. *2021; 44:383-394.*

Henry C. Barry, MD, MS
Professor
Michigan State University
East Lansing, Mich.

Left Atrial Appendage Occlusion During Cardiac Surgery for Another Reason Reduces the Risk of Stroke

Clinical Question

Does surgical left atrial appendage occlusion reduce the risk of stroke in patients with atrial fibrillation?

Bottom Line

Surgical closure of the left atrial appendage during cardiac surgery for another reason safely reduces the risk of ischemic stroke (number needed to treat = 43 over four years). Because the risk of stroke in the first 30 days after any cardiac surgery is approximately 2% and the absolute reduction in the risk of stroke with the procedure was approximately 2%, performing this procedure in patients who are not already undergoing cardiac surgery is not ideal. (Level of Evidence = 1b)

Synopsis

Left atrial appendage occlusion to reduce the risk of stroke caused by atrial fibrillation is sometimes performed as an adjunct procedure for someone who is undergoing cardiac surgery for another indication. The procedure has never been subjected to a randomized controlled trial. The researchers identified 4,770 adults with atrial fibrillation and a CHA_2DS_2VASc (congestive heart failure; hypertension; age 75 years or older [doubled]; diabetes mellitus; prior stroke, transient ischemic attack, or thromboembolism [doubled]; vascular disease) score of 2 or higher (mean = 4.2), indicating an elevated risk of stroke. The mean age was 71 years, 67% were men, and slightly more than one-half had permanent or persistent atrial fibrillation. Approximately one-half of the patients were receiving an oral anticoagulant at baseline. A total of 92.1% received the intervention in the treatment group, compared with 5% in the control group.

Allocation was properly concealed, and the patients, their care teams (other than the surgeons), and outcome assessors were masked to the treatment assignment. Groups were balanced at the start of the study, and analysis was by intention to treat. Patients were followed up for a mean of 3.8 years, and the trial was stopped early by a data and safety monitoring committee. Ischemic stroke occurred significantly less often in the intervention group (4.6% vs. 6.9%; hazard ratio = 0.66; 95% CI, 0.52 to 0.84; number needed to treat = 43); the reduction in risk of any stroke was similar between groups, and most of the benefit occurred beyond 30 days from the day of surgery. There was no significant difference between groups in all-cause mortality, hospitalization for heart failure, major bleeding, or myocardial infarction. Subgroup analyses revealed no clear differences by age, sex, use of anticoagulation, or other factors.

Study design: Randomized controlled trial (double-blinded)

Funding source: Foundation

Allocation: Concealed

Setting: Inpatient (any location) with outpatient follow-up

Reference: *Whitlock RP, Belley-Cote EP, Paparella D, et al.; LAAOS III Investigators. Left atrial appendage occlusion during cardiac surgery to prevent stroke.* N Engl J Med. *2021;384(22):2081-2091.*

Mark H. Ebell, MD, MS
Professor
University of Georgia
Athens, Ga.

Editor's Note: Dr. Ebell is deputy editor for evidence-based medicine for *AFP* and cofounder and editor-in-chief of Essential Evidence Plus, published by Wiley-Blackwell. Dr. Shaughnessy is an assistant medical editor for *AFP*. ■