Cochrane for Clinicians

Putting Evidence Into Practice

Can Mobile Phone–Based Interventions Improve Adherence to Medication for Primary Prevention of Cardiovascular Disease in Adults?

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Clinical Question

Do mobile phone–based interventions help patients adhere to medication regimens for hypertension and hypercholesterolemia for primary cardiovascular disease prevention?

Evidence-Based Answer

Mobile phone–based interventions improve adherence to cardiovascular medication regimens and may improve blood pressure control, but there is no patient-oriented evidence that these interventions are beneficial.[1] (Strength of Recommendation: C, based on disease-oriented evidence.)

Practice Pointers

Cardiovascular disease is a leading cause of mortality in the United States. In 2020, the National Vital Statistics System listed heart disease and stroke as the top and third leading causes of death, respectively.[2] Management of risk factors, including hypertension and hyperlipidemia, can help prevent cardiovascular disease; however, patient nonadherence to cardiovascular medication regimens can contribute to suboptimal management. The authors of this Cochrane review sought to demonstrate whether mobile phone–based interventions increase patient compliance with cardiovascular medication regimens.

This Cochrane review included 25,633 participants and 14 randomized controlled trials conducted in Europe, Asia, South Africa, and North and South America.[1] Participants received prescriptions for medications tailored to the prevention of cardiovascular disease and were recruited from primary and tertiary clinics, community outreach programs, and home visits. Interventions used mobile phones, and study duration was at least one year. Mobile phone interventions were compared with usual care, which often included verbal counseling and written information, and in one study consisted of text messages that included only general health information on lifestyle and diet but did not include information on how to manage specific diseases. The authors evaluated disease-oriented outcomes such as medication adherence and blood pressure and cholesterol levels, as well as patient-oriented outcomes such as patient satisfaction with treatment, cardiovascular disease events, and adverse events.

Most trials were subject to a high risk of bias, and the results were inconsistent. Only two studies were similar enough to allow meta-analysis. In these studies, the intervention groups received motivational and educational text messages that focused on blood pressure control and medication benefits. The intervention groups demonstrated increased adherence to blood pressure medication regimens (pooled odds ratio = 1.32; 95% CI, 1.06 to 1.65) compared with groups who received handouts or text messages with general healthy lifestyle information not specific to blood pressure control. Targeted text messaging in this comparison modestly improved the mean systolic blood pressure (mean decrease = 1.55 mm Hg; 95% CI, −0.25 to 3.36).

Seven studies compared intervention groups using targeted text messages as an adjunct to blood pressure management and focused on controlled blood pressure as an outcome. All studies were at high risk of bias because of design and intervention inconsistencies. Each of the studies demonstrated a positive but not statistically significant trend from the use of targeted text messaging compared with usual care, although the degree of difference in some studies was

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negligible (odds ratio = 1.01; 95% CI, 0.76 to 1.34). Thirteen studies described systolic blood pressure as an outcome and compared mobile phone interventions with usual care. Four of those studies evaluated smartphone delivery of targeted text messages and follow-up calls for blood pressure management. These studies noted statistically significant improvements in systolic pressures compared with patients who received usual care, with reductions ranging from 4.70 to 12.45 mm Hg. However, one study revealed that phone consultations in addition to text messages with disease recommendation summaries and follow-up appointment reminders resulted in a small increase in systolic blood pressure (2.80 mm Hg; 95% CI, 0.30 to 5.30).

In five studies, reduction of low-density lipoprotein cholesterol was the targeted outcome. Results could not be meta-analyzed in two of the studies because of study population and intervention heterogeneity. The authors found that usual care combined with mobile phone interventions, including pharmacist-led motivational interviewing and text messages with recommendations and clinical practice guidelines for hyperlipidemia treatment, regimen modifications, and follow-up visits, resulted in small reductions of questionable clinical significance in low-density lipoprotein cholesterol (9.2 mg per dL [0.24 mmol per L] in one study and 5.3 mg per dL [0.14 mmol per L] in the other) compared with usual care alone. In three other studies, the addition of mobile phone–based interventions did not improve outcomes. Patient satisfaction did not improve when mobile phone interventions were added to usual care, and there were no significant adverse events from the use of these interventions.

Although some guidelines advise cautious use of mobile phone–based health interventions for behavioral change to enhance lifestyle modifications, including diet and exercise,[3] no current society guidelines support the use of mobile phone–based interventions for medication adherence. Family physicians should be conscious of the modest disease-oriented benefits demonstrated in this review and consider patient motivation, individual preferences, health literacy, and ability and willingness to pay out-of-pocket for some applications and services before suggesting the use of mobile phone–based interventions.

The practice recommendations in this activity are available at http://www.cochrane.org/CD012675.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the U.S. Air Force or the Department of Defense.

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Antibiotics for the Treatment of COVID-19

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Clinical Question

Are antibiotics effective in treating patients with COVID-19?

Evidence-Based Answer

Azithromycin (Zithromax) is the most consistently studied antibiotic for use in treating patients infected with the SARS-CoV-2 virus; it does not improve mortality after 28 days or affect the clinical course for hospitalized adults with COVID-19.[1] (Strength of Recommendation [SOR]: A, consistent and good-quality patient-oriented evidence.)

In outpatient adults with asymptomatic or mild COVID-19, azithromycin does not reduce mortality, risk of hospitalization, or disease progression.[1] (SOR: B, inconsistent evidence or evidence from methodologically limited trials.)

Practice Pointers

Despite international efforts to contain the spread of the SARS-CoV-2 virus, as of December 2021 the pandemic has resulted in more than 260 million infections and more than 5.3 million deaths worldwide.[2] Treatment of COVID-19 depends on disease severity and patient setting, and the ongoing search for safe, effective, and accessible

treatment options continues. Antibiotics such as macrolides are a particular research focus, given their potential antiviral and anti-inflammatory properties.

This Cochrane review involved 11 randomized controlled trials and 11,281 patients.[1] Seven studies included inpatients (not further defined but designated as patients with moderate to severe SARS-CoV-2 infection), and four studies investigated outpatients (designated as patients with asymptomatic or mild SARS-CoV-2 infection). All of the included studies compared azithromycin with placebo, standard of care, or another antibiotic as a direct therapy against COVID-19. Other antibiotics currently under investigation include doxycycline, clarithromycin (Biaxin), and lincomycin (Lincocin), but the data on these or any other antibiotics were insufficient to include in the review. About half of the study results included in the review were rated as having a "low risk of bias" and the other half as "some concerns for the overall risk of bias."

Among inpatients with moderate to severe COVID-19, the authors found no significant difference with azithromycin use on all-cause mortality or improvement of clinical status at 28 days of follow-up. Regarding risks, no adverse events (including cardiac arrhythmias) occurred during the study period, and there was no increased risk of serious adverse events.

Among outpatients with asymptomatic or mild COVID-19, the authors found no evidence that azithromycin improved all-cause mortality, decreased hospitalization rates at 28 days of follow-up, or resolved symptoms by 14 days of follow-up. No outpatient studies reported any adverse events or cardiac arrhythmias within the follow-up time frame.

Antibiotic overuse and resulting antimicrobial resistance predate the pandemic as a global health threat.[3] Specifically, macrolides have a high resistance potential and have been identified as key targets of stewardship and monitoring to reduce antibiotic resistance.[4] With little evidence to support the effectiveness of azithromycin against the SARS-CoV-2 virus, family physicians should not routinely prescribe it for patients with COVID-19.

The practice recommendations in this activity are available at http://www.cochrane.org/CD015025.

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