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Q/ Does an early COPD diagnosis improve long-term outcomes?

EVIDENCE-BASED ANSWER

A/ IT DEPENDS. A diagnosis of chronic obstructive pulmonary disease (COPD) made using screening spirometry in patients without symptoms does not change the course of the disease or alter smoking rates (strength of recommendation [SOR]: A, preponderance of evidence from multiple randomized controlled trials

[RCTs]). However, once a patient develops symptoms of lung disease, a delayed diagnosis is associated with poorer outcomes (SOR: B, cohort studies). Active case finding (including the use of spirometry) is recommended for patients with risk factors for COPD who present with consistent symptoms (SOR: C, expert opinion).

Evidence summary

Early Dx didn't improve smoking cessation rates or treatment outcomes

A 2016 evidence report and systematic review for the US Preventive Services Task Force (USPSTF) identified no studies directly comparing the effectiveness of COPD screening on patient outcomes, so the authors looked first at studies on the outcomes of screening, followed by studies exploring the effects of early treatment.¹

The authors identified 5 fair-quality RCTs (N = 1694) addressing the effect of screening asymptomatic patients for COPD with spirometry on the outcome of smoking cessation. One trial (n = 561) found better 12-month smoking cessation rates in patients who underwent spirometry screening and were given their "lung age" (13.6% vs 6.4% not given a lung age; $P < .005$; number needed to treat [NNT] = 14). However, a similar study (n = 542) published a year later found no significant difference in quit rates with or without "lung age" discussions (10.9% vs 13%, respectively; P not significant). In the other 3 studies, screening produced no significant effect on smoking cessation rates.¹

As for possible early treatment benefits, the review authors identified only 1 RCT (n = 1175) that included any patients with

mild COPD (defined as COPD with a forced expiratory volume in 1 second [FEV₁] \geq 80% of predicted normal value). It assessed treatment with inhaled corticosteroids (ICS) in patients with mild COPD who continued to smoke. The trial did not record symptoms (if any) at intake. ICS therapy reduced the frequency of COPD exacerbations (relative risk = 0.63; 95% CI, 0.47-0.85), although patients with milder COPD benefitted little in absolute terms (by 0.02 exacerbations/year).¹ The review authors further noted that data were insufficient to make definitive statements about the effect of ICS on dyspnea or health-related quality of life.

But later diagnosis is associated with poorer outcomes

Two recent, large retrospective observational cohort studies, however, have examined the impact of an early vs late COPD diagnosis in patients with dyspnea or other symptoms of COPD.^{2,3} A later diagnosis was associated with worse outcomes.

In the first study, researchers in Sweden identified patients older than 40 years who had received a new diagnosis of COPD between 2000 and 2014.² They examined electronic health record data for 6 different "indicators" of COPD during the 5 years

prior to date of diagnosis: pneumonia, other respiratory disease, oral steroids, antibiotics for respiratory infection, prescribed drugs for respiratory symptoms, and lung function measurement. Researchers categorized patients as early diagnosis (if they had ≤ 2 indicators prior to diagnosis) or late diagnosis (≥ 3 indicators prior to diagnosis). Compared with early diagnosis ($n = 3870$), late diagnosis ($n = 8827$) was associated with

- a higher annual rate of exacerbations within the first 2 years after diagnosis (2.67 vs 1.41; hazard ratio [HR] = 1.89; 95% CI, 1.83-1.96; $P < .0001$; number of early diagnoses needed to prevent 1 exacerbation in 1 year = 79),
- shorter time to first exacerbation (HR = 1.61; 95% CI, 1.54-1.69; $P < .0001$), and
- higher direct health care costs (by €1500 per year; no P value given).

Mortality was not different between the groups (HR = 1.04; 95% CI, 0.98-1.11; $P = .18$).

The second investigation was a similarly designed retrospective observational cohort study using a large UK database.³ Researchers enrolled patients who were at least 40 years old and received a new diagnosis of COPD between 2011 and 2014.

Researchers examined electronic health record data in the 5 years prior to diagnosis for 7 possible indicators of early COPD: pneumonia, respiratory disease other than pneumonia, chest radiograph, prescription of oral steroids, prescription of antibiotics for lung infection, prescription to manage respiratory disease symptoms, and lung function measurement. Researchers categorized patients as early diagnosis (≥ 2 indicators prior to diagnosis) or late diagnosis (≥ 3 indicators prior to diagnosis). Compared with early diagnosis ($n = 3375$), late diagnosis ($n = 6783$) was associated with a higher annual rate of exacerbations over 3-year follow-up (1.09 vs 0.57; adjusted HR = 1.68; 95% CI, 1.59-1.79; $P < .0001$; or 1 additional exacerbation in 192 patients in 1 year), shorter mean time to first exacerbation (HR = 1.46; 95% CI: 1.38-1.55; $P < .0001$), and a higher risk of hospitalization within 3 years (rate ratio = 1.18; 95% CI, 1.08-1.28; $P = .0001$). The researchers did not evaluate for mortality.

Importantly, patients in the late COPD diagnosis group in both trials had higher rates of other severe illnesses that cause dyspnea, including cardiovascular disease and other pulmonary diseases. As a result, dyspnea of other etiologies may have contributed to both the later diagnoses and the poorer clinical outcomes of the late-diagnosis group. Both studies had a high risk of lead-time bias.

Recommendations from others

In 2016, the USPSTF gave a “D” rating (moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits) to screening asymptomatic adults without respiratory symptoms for COPD.⁴ Likewise, the 2017 Global Initiative for Chronic Obstructive Lung Disease (GOLD) report did not recommend routine screening with spirometry but did advocate trying to make an accurate diagnosis using spirometry in patients with risk factors for COPD and chronic, progressive symptoms.⁵

Editor’s takeaway

Reasonably good evidence failed to find a benefit from an early COPD diagnosis. Even smoking cessation rates were not improved. Without better disease-modifying treatments, spirometry—the gold standard for confirming a COPD diagnosis—should not be used for screening asymptomatic patients. **JFP**

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Even smoking cessation rates were not improved by an early COPD diagnosis.

References

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