Primary Care Providers' Views on Using Lung Age as an Aid to Smoking Cessation Counseling for Patients with Chronic Obstructive Pulmonary Disease

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Abstract

Purpose—Smoking cessation is the primary goal for managing patients with chronic obstructive pulmonary disease (COPD) who smoke. However, previous studies have demonstrated poor cessation rates. The "lung age" concept (an estimate of the age at which the FEV_1 would be considered normal) was developed to present spirometry data in an understandable format and to serve as a tool to encourage smokers to quit. Primary care physicians' (PCPs) views of using lung age to help COPD patients to quit smoking were assessed.

Methods—Post-intervention interviews were conducted with PCPs in the U.S. who participated in the randomized clinical trial, "Translating the GOLD COPD Guidelines into Primary Care Practice."

Results—29 physicians completed the interview. Themes identified during interviews included: general usefulness of lung age for smoking cessation counseling, ease of understanding the concept, impact on patients' thoughts of quitting smoking, and comparison to FEV_1. Most providers found lung age easy to communicate. Moreover, some found the tool to be less judgmental for smoking cessation and others remarked on the merits of having a simple, tangible number to discuss with their patients. However, some expressed doubt over the long-term benefits of lung age and several others thought that there might be a potential backfire for healthy smokers if their lung age was   to their chronological age.

Conclusions—This study suggests that lung age was well received by the majority of PCPs and appears feasible to use with COPD patients who smoke. However, further investigation in needed

to explore COPD patients' perspectives of obtaining their lung age to help motivate them to quit in randomized clinical trials.

Keywords

Chronic obstructive pulmonary disease; Smoking; Lung age

Introduction

Chronic obstructive pulmonary disease (COPD) is a common preventable and treatable disease that affects more than 15 million individuals in the United States [1, 2]. Smoking tobacco remains the main risk factor for COPD, and quitting smoking will help slow progression of the disease [3]. Smoking cessation therefore is the primary goal in the management of COPD patients who continue to smoke [3, 4].

While 50 % of smokers with COPD are willing to consider smoking cessation support, [5] smoking cessation may be difficult to attain particularly among smokers who have high levels of nicotine addiction and high levels of tobacco consumption [6, 7]. Even after COPD patients receive optimal smoking cessation counseling (combined counseling and pharmacotherapy) [8], patients with COPD may not be able to quit smoking [9].

It has been suggested that a potential method to increase quit rates among smokers with COPD is "to communicate lung function in a manner that is easily understood and stimulates a desire to quit" [10]. One such approach is to provide patients with their lung age (i.e., an estimate of the age at which the observed FEV_1 would be considered normal) based on their spirometry data. Lung age has been examined in a number of studies with conflicting results. [11–15] Given that primary care providers play a key role in counseling smoking COPD patients at each visit [16], we were interested in exploring primary care providers' views about using lung age with COPD patients who continue to smoke.

Methods

Details of the study have been published elsewhere. [17] Briefly, the study was a two-group randomized clinical trial that tested the effectiveness of translating the COPD guidelines into clinical practice among 30 primary care practices. The intervention arm received an intervention consisting of three academic detailing visits, an iPad-based patient activation tool that assessed risk of COPD, a net-book that ran a COPD guideline decision support tool, and a COPD patient education toolkit including a website and a portable spirometer. The usual care arm received visits on the same schedule as the academic detailing visits, a website link to the GOLD Guidelines, and a portable spirometer. The intervention was of 1-year duration. Lung age was provided as part of the spirometry report for both the control and intervention practices. Following completion of the intervention, telephone semi-structured interviews (see Table 1), were conducted with the primary care providers who participated in the study. Informed consent was obtained from all participants included in the study. These audio-recorded interviews lasted about 30 min. The interview guide consisted of 13 core questions asked of each participant, supplemented with spontaneous probes and follow-up questions. The interviews evaluated providers' thoughts about the

study, barriers, and facilitators to implementing spirometry into daily office routine, use of provider interactive tools, use of the GOLD COPD guidelines, and use of lung age for smoking cessation counseling.

Several of the research staff reviewed the recordings and summarized the findings. Based on the summaries, one of the senior researchers (DP) developed a codebook. Another research staff (SE), an undergraduate research assistant, transcribed the interviews, and then coded them for themes and topical categories using Weft QDA version 1.0.1 (http://www.pressure.to/qda/). As analysis of the transcripts proceeded, more detailed coding categories were generated based on the emerging thematic patterns. These were reviewed by the two senior researchers (DP, RG) to ensure coding consistency and to resolve any anomalies or discrepancies. The item "usefulness of lung age" was examined for sub-themes and trends, and interview excerpts were sorted into sub-themes. The analysis team checked for variation in responses depending on treatment group, medical staff who discussed lung age with patients, and use of additional measures in smoking cessation counseling (e.g., Fletcher & Peto curve that presents a model of the decline of respiratory function during the lifespan) [18]. Quotes were selected to illustrate the themes. The study protocol and Informed Consent Forms were approved by Memorial Hospital of Rhode Island Institutional Review Board.

Results

Of the 32 providers recruited, 29 physicians were interviewed; three were unreachable or too busy and did not participate in the interview. There were no significant differences in demographic information of physicians who were and were not interviewed. Additionally, physician demographic characteristics did not differ significantly between the control and intervention groups (Table 2).

Using the analytic procedure described above, eight themes were identified about the lung age tool: general usefulness, patient reactions/impact, motivation to quit, backfiring in young, healthy smokers, ease of understanding the concept, comparison to FEV_1, no patient reaction, less judgmental, and lung age not used by some providers (Table 3).

Almost eighty percent of the participants used lung age with their patients and most thought it was a useful concept. As one provider stated:

> "I love the fact that the instrument actually gave me a lung age because I think that made a huge difference…and so I've been able to get more responses out of the patients too."

Many providers felt that lung age had a dramatic impact on patients and was very easy to communicate, with one-fourth of the providers remarking on the merits of having a simple, tangible number to discuss.

> "They see a lung age and they compare from their real age and it's more shocking to them and I believe there's more impact. So I think in that way it makes it more effective."

> "Literally you'd see the blood rush out of their face when they saw the numbers, and they realized they had a significant problem. And that was your quintessential teachable moment. So you grabbed it with both hands."

Over fifty percent of the physicians reported that lung age was very motivating for patients, recalling that patients expressed greater interest in trying to quit or going on treatment medications and some reporting cases of patients successfully quitting.

> "If their lung age was older than their regular age, they would often go out of there saying 'Oh, I've got to quit smoking, I've just got to quit smoking!'" " 'And sometimes that simple number, beyond all the symptoms and anything else they describe, is enough to have a significant impact on their consideration of quitting smoking or using their medication more regularly."

Several physicians commented that the use of lung age helped make smoking cessation counseling less judgmental, as they were discussing a quantitative test result rather than an unhealthy behavior.

> "There's less judgment when there's a number to point to rather than a behavior. So I think it takes some of the emotion out." "They get less defensive."

A number of physicians reported that lung age was much preferable to discussing FEV_1 percentages with patients, as it was easier to grasp.

> "It leaves more of an impression than telling them that their FEV_1 percentage is down. So the lung age, definitely, I think, has an impact on people."

> "[Lung age] is a meaningful concept to them. That was something that they could relate to. You know, a 40 % reduction [of lung capacity], to me, doesn't mean very much."

While most of the physicians who used lung age had positive comments, several expressed doubt over the long-term impact of lung age. They noted how complex the decision to quit smoking is; others did not want to give patients their lung age because they felt it was too negative.

> "The real question is whether they do [make changes] or not in the long run." "The reason I don't use lung age is because I tend to want to focus more on function and on positive, than giving them negative." "A lot of the people I work with are kind of hopeless already, so giving them one more piece of horrible news isn't necessarily going to motivate them."

One-fourth of the physicians felt that lung age might not work for young, healthy smokers if their lung age was the same or less than their chronological age and might therefore serve as a disincentive to quit smoking.

> "It's always a gamble with smokers because sometimes they come out pretty good." "I almost hate to do the positive reinforcement, you know, that your numbers were actually really good, nothing's been changed yet."

One physician discussed FEV_1 instead of lung age simply due to personal preference, while another physician used both the FEV_1 and lung age (for emotional impact).

> "I would show them what a normal curve should look like… and what theirs looks like, and how different the numbers were and we'd talk about that…I never thought anything about [lung age], I just used the graph." "I really just look at the numbers… the percentage and prediction of the numbers of the FVC, FEV_1, that's basically what I focus on. Sometimes I used [lung age] for the emotional impact on smokers, to help get them to stop."

Even though lung age may be less difficult to understand than FEV_1, not all physicians felt that lung age would be appropriate for their population. As one physician, who worked with underserved patients pointed out, the abstract concept of lung age may still be difficult to understand.

> "Some of them had a little bit of trouble with 'What do you mean, I'm this old, but you're saying my lungs are a different age?' and that didn't really…didn't jive with them. And I think it's a health literacy problem."

Conclusions

This study examined primary care physicians (PCPs)' views on using spirometry-based lung age as a motivational tool to help encourage smokers with COPD to quit. Of interest was that the lung age tool was widely accepted by most physicians. The lung age concept was initially developed by Morris and Temple [11] to express spirometry results in an easily understandable manner in order to encourage patients to change their smoking behavior. Since the development of the lung age tool, several studies [12, 19] have reported support for the use of lung age to improve smoking quit rates while others have not found an association. [15, 20] Our findings suggest a wide acceptance of the lung age tool among PCPs for use as an aid for smoking cessation among COPD patients who smoke. However, further investigation in needed to explore COPD patients' perspectives of obtaining their lung age to help motivate them to quit in randomized clinical trials.

Acknowledgments

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Table 1

Selected interview questions used to explore providers' thoughts about using lung age to help motivate smokers with COPD to quit

1	In what ways do you think your approach to COPD diagnosis and management has changed over the past year, since participating in this study?
	a. If there were changes
	i. Probes: can you please explain why you made those changes, why?
	ii. How is it working out?
	iii. What's different?
2	If one of your colleagues asked you about the lung age concept (lung age, website), what would you tell them?
	a. What aspects of the Lung Age Study did you find particularly appealing? Why?
	b. What aspects of the Lung Age Study did you find not to be useful? Why?
3	Would you recommend the lung age system to your colleagues?
	a. Why or why not?
	b. Probe: What aspects of the Lung Age Study did you find particularly appealing
	c. What aspects did you find not to be useful?
4	How do you incorporate the lung age concept into your smoking cessation counseling?
5	In what ways have you engaged your staff in COPD diagnosis, or talking about how diagnosis will occur in your practice? Have you talked to them about tools given to you by us?
	a. If yes…
	b. Probes: Please describe. What took place?
6	Use of the spirometer—Was the spirometry system (spirometer, laptop, printer) useful in your practice? Why or why not?
	a. How often did you discuss COPD risk reduction?
	b. How often did you print the patient education page?
	c. How often did you tell the patient their lung age and discuss smoking cessation?

Table 2

Demographics of Lung Age Physicians and Their Patients

Variable	Group			P value
	Control	Intervention	Total	
Provider characteristics	n = 16	n = 13	n = 29	
Age[a]	49.6 ± 9.0	48.8 ± 7.3	49.2 ± 8.2	0.78
Years in practice[a]	17.0 ± 8.6	17.2 ± 8.1	17.1 ± 8.3	0.96
Gender[b]	9 (56.3)	9 (69.2)	18 (62.1)	0.49
Male				
Race/ethnicity[b]				
White, not Hispanic	14 (87.5)	10 (76.9)	24 (82.8)	0.47
Asian	2 (12.5)	3 (23.1)	5 (17.2)	
Board certification[b]				
Family medicine	13 (81.3)	10 (76.9)	23 (79.3)	0.78
Internal medicine	3 (18.8)	3 (23.1)	6 (20.7)	
Practice size[b]				
Solo	2 (12.5)	5 (38.5)	7 (24.1)	
2-Clinician practice	4 (25.0)	3 (23.1)	7 (24.1)	
Medium family medicine group	5 (31.3)	1 (7.7)	6 (20.7)	
Large family medicine group	2 (12.5)	0 (0)	2 (6.9)	0.58
Multi-specialty group	0 (0)	2 (15.4)	2 (6.9)	
Faculty/resident practice	2 (12.5)	1 (7.7)	3 (10.3)	
Other	1 (6.3)	1 (7.7)	2 (6.9)	
Certified PCMH[b,c]	7 (43.8)	7 (53.8)	14 (48.3)	0.60
Use of spirometry[b]	12 (75.0)	8 (61.5)	20 (69.0)	0.45

[a] Mean ± standard deviation

[b] Number (%)

[c] Patient Centered Medical Home (PCMH) certification based on level of National Committee for Quality Assurance (NCQA) certification

Table 3

Providers' views on lung age

General usefulness

I love the fact that the instrument actually gave me a lung age because I think that made a huge difference

I was impressed with the whole concept and I still utilize it

I utilize the spirometry as a clinical motivating tool and I think it really works for patients

I think it's a very useful concept for patients

Patient reactions/impact

They were impressed by the fact that I could tell them how old their lungs were

They see a lung age and they compare from their real age and it's more shocking to them and I believe there's more impact. So I think in that way it makes it more effective

I did see a couple of people, their faces kind of dropped and they're like "What?? My lungs are twenty years older than I am, that's awful!" And "I see what you mean, I really should quit smoking"

I think that the lung age number itself is such a simple concept and it's very impactful on the patients

Literally you'd see the people-the blood rush out of their face when they saw the numbers, and they realized they had a significant problem. And that was, you know, your quintessential teachable moment. So you grabbed it with both hands

We find it is one of the more powerful things to use on smokers

Showing them their lung age is a powerful thing

I never used lung age, I still don't use it a lot, but whenever I do, it's the patients, the people I show it to get really somber

It helps me convince the patients that there's something going on

Motivation to quit smoking

If their lung age was older than their regular age, they would often go out of there saying "Oh I've got to quit smoking, I've just got to quit smoking!"

It can potentially be a motivating tool to sort of show somebody where they are and what's likely to be a progressive, dangerous path of continued smoking or other risk factors for COPD

In a couple patients, they were ready to pull the trigger because they didn't want to have the lungs of a 75 year old. And so it really was a very positive intervention in that regard

And sometimes that simple number, beyond all the symptoms and anything else they describe, is enough to have a significant impact on their consideration of quitting smoking or using their medication more regularly

I had a patient that just quit, once you, you know-49 and the age was 70. That scared him enough to really motivate him

It was a great motivator for people to follow through with the smoking cessation

I think I found them to be much more responsive in my efforts to have them stop smoking

Every possible tool that you can use that makes people sort of move a little further, yeah, is good

I do think it does surprise some people that their denial isn't reality, so a percentage of people do respond to the [lung age] numbers

Their initial reaction is invariably one of surprise and, you know, expressing the type of talk that indicates that they're going to make changes. The real question is whether they do or not in the long run

Backfiring in young, healthy smokers

It's always a gamble with smokers because sometimes they come out pretty good, and then you're really shafted

I almost hate to do the positive reinforcement, you know, that your numbers were actually really good; nothing's been changed yet

This is a pretty powerful tool that you can use which in some cases, yeah, you may get stumped and not have all the right stuff to talk to them

Ease of Understanding Concept

It's like showing them a picture of their lung

It's a test that the patients can see a number, and it will help them take their disease more seriously

It's a way of boiling down some of the concepts of COPD for a patient. It's a very eye-opening experience for a patient

For some of my patients I think it was a hard concept-even lung age. You know, for a lot of them it would make sense but for some of them it was still hard

A number is a lot easier for a patient to grasp. So I think it makes it a lot more useful test

I think anything that kind of boils it down for the patients in a kind of a realistic way is great

Comparison to FEV_1

It leaves more of an impression than telling them that their FEV_1 percentage is down. So the lung age definitely, I think, has an impact on people

That was a meaningful concept to them. That was something that they could relate to. You know, a 40 % reduction, to me, doesn't mean very much

Patients understand that a lot better than percentages

No patient reaction

Surprisingly some are indifferent

It's just sort of a matter of fact. "Well yeah, I know, I'm a smoker, I've been smoking, and I know that my lungs are not healthy"

Less judgmental

There's less judgment when there's a number to point to rather than a behavior. So I think it takes the pressure out of the interaction when you're talking about a number

They get less defensive

It takes some of the emotion out

Physician didn't use lung age

I'm not a strong believer in negative feedback

I didn't pay that much attention to lung age itself, I really just look at the numbers-you know, the percentage and prediction of the numbers of the FVC, FEV_1, that's basically what I focus on

The reason I don't use the lung age is because I tend to want to focus more on function and on positive than giving them, you know, negative

A lot of the people I work with are kind of hopeless already, so giving them one more piece of horrible news isn't necessarily going to motivate them