RESEARCH

THIS WEEK'S RESEARCH QUESTIONS

CORBIS

Tackling chronic obstructive pulmonary disease in Guangdong, China

Around 8% of Chinese people aged 40 have chronic obstructive pulmonary disease (COPD). While this proportion is lower than the worldwide prevalence of 10%, it probably reflects the fact that, even though a third of the world's smokers live in China, tobacco use has been widespread there for fewer years than in the West.

Yumin Zhou and colleagues report on a remarkable cluster randomised controlled trial to both prevent and treat COPD in middle aged and older people in Guangzhou city, Guangdong, where an extensive and complex intervention was offered in one of two communities (p 1203). The main components were a public health education campaign, the cleaning up and eventual relocation of a local cement factory, and—for people with COPD—personal care plans, bronchodilators, personalised advice on smoking cessation, and nicotine replacement therapy through tea and patches.

In the intervention community there was a significant improvement in the primary outcome measure, the annual rate of decline in forced expiratory volume in one second (FEV_1). Secondary outcomes during the four year follow-up were significantly improved too: and while some were soft and self reported (smoking cessation and exposure to environmental tobacco smoke) hard outcomes included lower cumulative death rates from all causes, and better outdoor air quality as measured by the local environmental monitoring station. However, there were no differences in cumulative incidence rate of COPD and cumulative death rate from COPD between the two communities.

This trial is included in the Chinese Clinical Trials Registry (www.chictr.org) which makes fascinating reading. It currently records more than 1000 studies in English and Chinese and is part of WHO's registry network.

Psychosis and substance abuse

People in the UK who have psychosis are 25% more likely to have a drink or drug misuse problem than members of the general population. Evidence suggests that the best non-pharmacological approach to treating such individuals is to target their mental health and their substance misuse problem simultaneously, but no integrated psychosocial intervention has been proved to be effective so far.

Christine Barrowclough and colleagues conducted a randomised controlled trial of one such intervention—integrated motivational interviewing and cognitive behavioural therapy—in people with schizophrenia, schizophreniform disorder, or schizoaffective disorder who were diagnosed with dependence on or misuse of drugs, alcohol, or both (p 1204). They found that adding 12 months of the intervention to standard care had no effect on hospital admissions, death, symptom outcomes, or functioning during the intervention period or in the 12 months after completion of therapy. The intervention did transiently increase patients' motivation to change, however, and reduced the amount of substance used. Interestingly, the integrated therapy seemed to have more effect on people who misused alcohol than on those who misused drugs, but this finding was from an exploratory subgroup analysis and should therefore be viewed with caution.

The *BMJ*'s clinical editors were impressed with the authors' attempts to assess a difficult to study population and believe that the essentially negative findings of this paper are of some importance. "It was a very difficult trial to undertake and I have a considerable sympathy for the researchers," said Domhnall MacAuley, primary care editor. "As an intervention that, empirically, we might have expected to work, this is a useful negative trial."

Variation in quality of NHS care

The publication this week of the NHS *Atlas of Variation* has revealed just how much the quality of NHS healthcare differs around the United Kingdom (http://www.rightcare.nhs.uk/atlas/). The atlas shows that the level and quality of care for conditions such as cancer and stroke can vary by twofold and fourfold, respectively, in different parts of the country (p 1184).

Dulcie McBride and colleagues' research provides further evidence of the "postcode lottery" faced by patients in the UK by showing that referrals from primary care vary on the basis of the patient's age, sex, and level of social deprivation (p 1206). Patients aged 85 or older were less likely to be referred by their general practitioner for postmenopausal bleeding, hip pain, or dyspepsia than were patients aged 55-64. Furthermore, women with hip pain and people in the lowest fifth in terms of socioeconomic deprivation who had hip pain or dyspepsia were less likely to be referred than men or better off individuals, respectively.

LATEST RESEARCH: For this and other new research articles see http://www.bmj.com/channels/research.dtl

Vitamin B, omega 3, and CVD Observational studies have reported inverse associations between cardiovascular disease and intake of B vitamins and omega 3 fatty acids, but randomised trials have so far failed to establish a link. That remains the case—in France, Pilar Galan and colleagues did a randomised placebo controlled trial in patients with established coronary or cerebrovascular disease, and they found no evidence that daily dietary supplementation with these nutrients reduced the risk of major cardiovascular events (doi:10.1136/bmj.c6273).

Community based integrated intervention for prevention and management of chronic obstructive pulmonary disease (COPD) in Guangdong, China: cluster randomised controlled trial

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STUDY QUESTION

Can community based integrated interventions have an effect on early prevention and management of COPD, especially the annual rate of decline in forced expiratory volume in one second (FEV_1)?

SUMMARY ANSWER

A community based integrated intervention, consisting of systematic health education, intensive and individualised intervention, and treatment and rehabilitation for COPD, can have a significant impact on the prevention and management of COPD, mainly reflected in the annual rate of decline in FEV_1.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

A single factor intervention is likely to have limited effects in COPD. Community based integrated interventions can decrease the rate of decline in FEV_1, probably from the combined effects of smoking cessation and improvements in air pollution.

Design

Cluster randomised controlled trial.

Setting

Eight healthcare units in Guangzhou city, China.

Participants

Of 1062 people aged 40-89, 872 (101 with COPD and 771 without COPD) were allocated to the intervention or the usual care programmes.

Intervention

Participants were randomly assigned to integrated intervention (systematic health education, intensive and individualised intervention, treatment, and rehabilitation) or usual care.

Main outcome measures

Annual rate of decline in forced expiratory volume in one second (FEV_1) before use of bronchodilator.

Results

Annual rate of decline in FEV_1 was significantly lower in the intervention community than the control community, with an adjusted difference of 19 ml (95% confidence interval 3 to 36 ml/year) and 0.9% (0.1% to 1.8%) of predicted values (all P<0.05), as well as a lower annual rate of decline in FEV_1/FVC (forced vital capacity) ratio. There were also higher rates of smoking cessation (21% *v* 8%, P<0.004) and lower cumulative death rates from all causes (1% *v* 3%, P<0.009) in the intervention community than in the control community during the four year follow-up. Improvements in knowledge of COPD and smoking hazards, outdoor air quality, environmental tobacco smoke, and working conditions were also achieved (all P<0.05).

Limitations of study

We evaluated annual decline in FEV_1 only before use of a bronchodilator. We did not examine post-bronchodilator values because patients without COPD at baseline did not have a bronchodilator test. In addition, COPD was defined by post-bronchodilator FEV_1/FVC ratio below 0.7, not by percentage of FEV_1/FVC ratio below the fifth centile. Changes in risk factors such as smoking status were based on self report.

Generalisability to other populations

Though our methods and experience might be culture and condition specific, the outcomes that smoking cessation, improvement in air pollutants, and reduction in environmental tobacco smoke have contributed to the slowing rate of decline in FEV_1 should apply throughout the world.
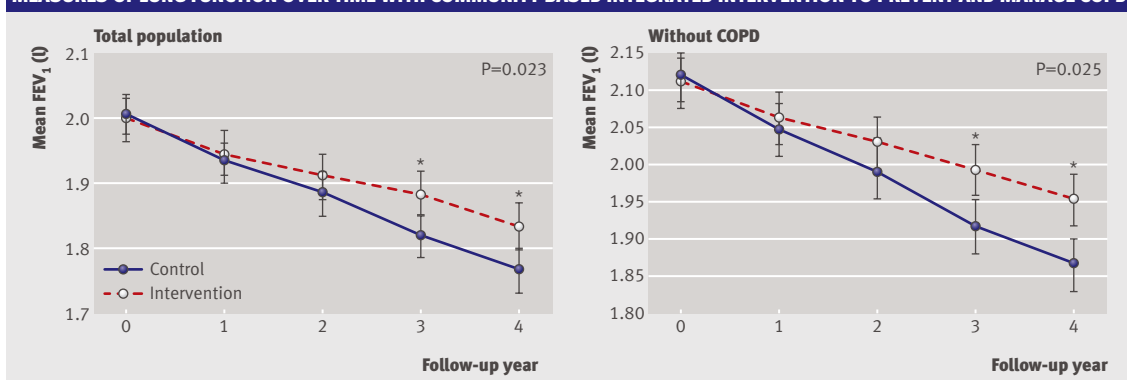
MEASURES OF LUNG FUNCTION OVER TIME WITH COMMUNITY BASED INTEGRATED INTERVENTION TO PREVENT AND MANAGE COPD

Integrated motivational interviewing and cognitive behavioural therapy for people with psychosis and comorbid substance misuse: randomised controlled trial

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STUDY QUESTION

Does integrated motivational interviewing and cognitive behavioural therapy delivered over 12 months in addition to standard care improve clinical outcomes and reduce substance misuse for patients with psychosis and a comorbid substance use problem?

SUMMARY ANSWER

The psychological therapy did not reduce death from any cause or admission to hospital in the 12 months after completion of therapy, but did result in a reduction in amount of substance used that was maintained for 12 months.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

There is no compelling evidence to support any one psychosocial treatment for such patients. Motivational interviewing and cognitive behavioural therapy might facilitate engaging patients in treatment but it does not improve clinical outcomes for this group.

Design

In this two centre, open, rater blind randomised controlled trial, participants were randomly allocated either to integrated motivational interviewing and cognitive behavioural therapy plus standard care or to standard care alone. The year long therapy of up to 26 sessions was delivered by trained therapists and had two phases: "motivation building," which entailed engaging the patient then exploring and resolving ambivalence for change in substance use; and "action," which comprised supporting and facilitating change by using cognitive behavioural approaches.

Participants and setting

Of 722 patients referred to the trial in Greater Manchester, Lancashire, and south London, the 327 patients randomised had schizophrenia, schizophreniform disorder, or schizoaffective disorder and dependence on or misuse of drugs, alcohol, or both according to the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition.
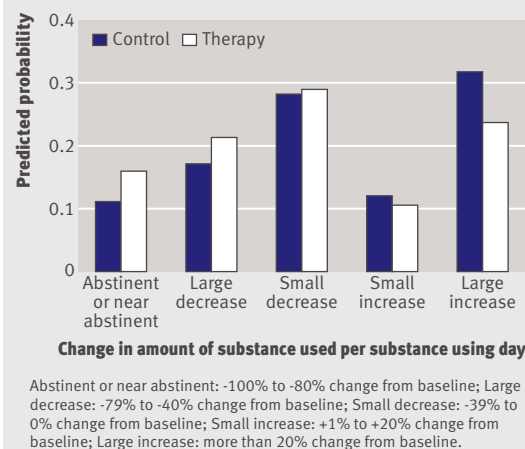
Primary outcome

This was death from any cause or admission to hospital in the 12 months after completion of therapy.

Main results and the role of chance

Data on the primary outcome were collected for 326 participants, and data on both symptoms (positive and negative syndrome scale) and self reported substance use (timeline followback) were available for 269 participants at 12 months.

Therapy had no beneficial effect on hospital admissions or death during follow-up, with 38/163 of the therapy group and 33/163 of controls deceased or admitted (adjusted odds ratio 1.16, 95% confidence interval 0.68 to 1.99; P=0.579).

PROBABILITY OF CHANGE FROM BASELINE IN AVERAGE DAILY AMOUNT OF MAIN SUBSTANCE USED

Abstinent or near abstinent: -100% to -80% change from baseline; Large decrease: -79% to -40% change from baseline; Small decrease: -39% to 0% change from baseline; Small increase: +1% to +20% change from baseline; Large increase: more than 20% change from baseline.

There was no effect of therapy on the frequency of substance use, but therapy did have a statistically significant effect on the amount used per substance using day (adjusted ORs for main substance 1.50, 95% CI 1.08 to 2.09; P=0.016; and all substances 1.48, 95% CI 1.07 to 2.05; P=0.017). There were no effects of treatment on clinical outcomes such as relapses, psychotic symptoms, functioning, and self harm.

Harms

There were seven deaths during the trial: two in the therapy group and five in the control group. Our independent data monitoring committee was informed of all adverse events including deaths and considered them unrelated to the trial treatments.

Bias, confounding, and other reasons for caution

There was good uptake of therapy sessions, and therapists were well trained and supervised. Substance use self reports were validated by assessments from other sources, and we attained good reliability on all observer rated outcomes. Independent assessors were blinded.

Generalisability to other populations

We had low refusal and high rates of follow-up, the sample was drawn from both urban and rural populations, and the pattern of substance use was typical for patients with psychosis and a comorbid substance use problem.

Trial registration number

Current Controlled Trials: ISRCTN14404480.

Association between general and central adiposity in childhood, and change in these, with cardiovascular risk factors in adolescence: prospective cohort study

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STUDY QUESTION

Are body mass index (BMI), waist circumference, and fat mass in childhood differentially associated with cardiovascular risk factors in adolescence?

SUMMARY ANSWER

BMI, waist circumference, and total fat mass assessed at age 9-12 are positively associated with cardiovascular risk factors at age 15-16, with similar magnitudes of association.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

In children annual increases in BMI reflect increases in lean mass more so than fat mass, so BMI is thought to be a poor measure of adiposity and hence cardiovascular risk at this age. BMI, waist circumference, and total fat mass assessed at age 9-12 are positively associated with cardiovascular risk factors at age 15-16, with similar magnitudes of association, suggesting that BMI adequately identifies cardiovascular risk in this age group.

Participants and setting

The study included 5235 children from the Avon Longitudinal Study of Parents and Children (ALSPAC) who attended the assessment at age 9-10 or 11-12 and the assessment at 15-16.

Design, size, and duration

This was a prospective cohort study examining the association of BMI, waist circumference, and fat mass determined by dual energy x ray absorptiometry at age 9-12 with systolic and diastolic blood pressure and concentrations of fasting low density lipoprotein cholesterol, high density lipoprotein cholesterol, triglycerides, glucose, and insulin measured at age 15-16.

Main results and the role of chance

In girls and boys all three adiposity measures were associated with increased odds of adverse levels of systolic blood pressure, fasting low density lipoprotein cholesterol, triglycerides, high density lipoprotein cholesterol, and insulin. In boys they were also associated with increased odds of high glucose concentration. Adjustment for potential confounding factors did not substantively alter associations. BMI, waist circumference, and fat mass were strongly correlated with each other (correlation coefficients 0.89-0.94), and associations of the three with cardiovascular outcomes were of similar magnitude with no statistical evidence of heterogeneity (all P>0.2). When either waist circumference or fat mass, or both, were added to models including BMI they did not increase the variation in the cardiovascular risk factors already explained by BMI and confounders alone.

Girls who were overweight/obese at age 9-12 but were normal weight by 15-16 had similar odds of adverse levels of risk factors to those who were normal weight at both ages. In boys, odds of adverse levels of systolic blood pressure, high density lipoprotein cholesterol, triglycerides, and insulin remained higher in this group compared with those who were normal weight at both ages but were lower than in those who were overweight/obese at both ages.

Bias, confounding and other reasons for caution

Though we adjusted for a wide range of potential confounding factors, we cannot rule out residual confounding. Children whose mothers were from lower socioeconomic backgrounds and were younger at the time of birth of the child were less likely to be included in this study.

Generalisability to other populations

The participants in this study are predominantly of European origin; all were born in the UK. We cannot assume that these findings would generalise to other ethnic groups or to children brought up in difference environments.

PROSPECTIVE ASSOCIATIONS BETWEEN BMI, WAIST, AND FAT MASS (ASSESSED AT AGE 9-12) AND SYSTOLIC BLOOD PRESSURE AND INSULIN CONCENTRATION AT AGE 15-16. FIGURES ARE ODDS RATIOS OF OUTCOME PER 1SD (Z SCORE) OF EXPOSURE (95% CONFIDENCE INTERVALS)

Exposure and outcome*	Girls (n=2747)		Boys (n=2488)		P value§
	Model 1†	Model 2‡	Model 1†	Model 2‡	
BMI					
High systolic BP	1.24 (1.13 to 1.37)	1.23 (1.10 to 1.38)	1.26 (1.15 to 1.37)	1.24 (1.13 to 1.37)	0.91
High insulin	1.53 (1.31 to 1.79)	1.45 (1.22 to 1.73)	1.88 (1.63 to 2.16)	1.84 (1.56 to 2.17)	‹0.001
Waist circumference					
High systolic BP	1.21 (1.09 to 1.35)	1.18 (1.05 to 1.33)	1.24 (1.12 to 1.36)	1.20 (1.08 to 1.33)	0.85
High insulin	1.58 (1.32 to 1.88)	1.47 (1.20 to 1.80)	1.89 (1.64 to 2.18)	1.84 (1.56 to 2.17)	‹0.001
Fat mass					
High systolic BP	1.26 (1.14 to 1.40)	1.24 (1.11 to 1.39)	1.20 (1.08 to 1.32)	1.20 (1.08 to 1.31)	0.78
High insulin	1.58 (1.33 to 1.87)	1.48 (1.22 to 1.79)	1.99 (1.72 to 2.30)	1.95 (1.65 to 2.29)	‹0.001

*High systolic blood pressure ≥130 mm Hg; high insulin ≥16.95 IU/l.
†Adjusted for age, height, and height[2].
‡As for model 1 plus adjusted for maternal age, parity, family social class, maternal education, paternal education, birth weight, gestational age, maternal and paternal BMI, and puberty (additional adjustment for age at menarche in girls did not alter associations presented here for girls).
§Interaction test for association in fully adjusted model (model 2): tests null hypothesis that fully adjusted associations in girls and boys are same.

Explaining variation in referral from primary to secondary care: cohort study

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STUDY QUESTION

To what extent do referrals from primary to secondary care vary by age, sex, and socioeconomic circumstances of the patient? Symptoms examined were postmenopausal bleeding (a potentially life threatening condition), hip pain (for which explicit referral guidelines are lacking), and dyspepsia (referral guidance provided for patients over 55 years only).

SUMMARY ANSWER

For all three symptoms older patients were less likely to be referred. In addition, women were less likely to be referred for hip pain, and the likelihood of referral also fell with increasing deprivation for patients with hip pain and those under 55 with dyspepsia.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Women, older people, and socially disadvantaged groups are more likely to consult their doctor yet are less likely to receive secondary care. Whether these inequalities occur within secondary care or at referral from primary care is unclear. Inequalities in referral were more likely to occur in the absence of explicit referral guidance and potentially life threatening conditions.

Participants and setting

Patients presenting with postmenopausal bleeding, hip pain, or dyspepsia to 326 UK general practices, 2001-7.

Design, size, and duration

A cohort study using individual patient data from the health improvement network database in primary care. The study sample comprised 5492 patients with postmenopausal bleeding, 23 121 with hip pain, and 101 212 with dyspepsia.

Main results and the role of chance

Overall, 61.4% (n=3374) of patients with postmenopausal bleeding, 17.4% (n=4019) with hip pain, and 13.8% (n=13 944) with dyspepsia were referred. Women were less likely than men to be referred for hip pain (hazard ratio 0.90, 95% confidence interval 0.84 to 0.96). Inequalities in referral by age occurred for all three symptoms (table). More deprived patients with hip pain and dyspepsia (if aged <55) were less likely to be referred. Adjusted hazard ratios for those in the most deprived fifth compared with least deprived were 0.72 (95% confidence interval 0.62 to 0.82) and 0.76 (0.68 to 0.85), respectively. No socioeconomic gradient in referral was evident for postmenopausal bleeding.

Bias, confounding, and other reasons for caution

We controlled for comorbidity but could not fully assess the impact of other potential confounders (smoking, body mass index, alcohol intake) owing to a paucity of data. Non-standardised and incomplete coding of referral in this routinely collected data source may have led to underestimation of the number of referrals. Also, it is possible that we failed to include some eligible cases where practitioners coded patient presentation as diagnoses rather than symptoms. Use of routine data should, however, limit selection and reporting biases. Socioeconomic circumstances were measured at small area level, possibly leading to non-differential misclassification and therefore underestimation of the inequalities.

Generalisability to other populations

The results from this national study apply to men and women in the United Kingdom; extrapolation of the results to other countries with different healthcare systems would not be appropriate.

ODDS RATIOS AND HAZARD RATIOS FOR ASSOCIATION BETWEEN REFERRAL TO SECONDARY CARE FOR PRESENTING SYMPTOMS AND AGE AND DEPRIVATION

Variables	Presenting symptom			
	Postmenopausal bleeding (n=5492)*	Hip pain (n=23121)†	Dyspepsia (n=101 212)†	
			<55 years	>55 years
Age group (years):				
<25	—	—	0.33 (0.30 to 0.37)	—
25-34	—	—	0.48 (0.45 to 0.51)	—
35-44	—	—	0.68 (0.65 to 0.72)	—
45-54	—	—	0.88 (0.84 to 0.93)	—
55-64	1	1	1	1
65-74	0.89 (0.78 to 1.02)	1.18 (1.10 to 1.28)	—	0.94 (0.89 to 0.99)
75-84	0.64 (0.55 to 0.74)	1.13 (1.04 to 1.23)	—	0.84 (0.78 to 0.90)
≥85	0.39 (0.31 to 0.49)	0.68 (0.57 to 0.81)	—	0.56 (0.47 to 0.66)
Deprivation:				
1 (least deprived)	1	1	1	1
2	0.96 (0.81 to 1.14)	0.92 (0.84 to 1.01)	0.97 (0.90 to 1.04)	0.88 (0.81 to 0.95)
3	1.02 (0.83 to 1.26)	0.84 (0.75 to 0.92)	0.87 (0.81 to 0.94)	0.89 (0.81 to 0.96)
4	1.05 (0.84 to 1.32)	0.80 (0.72 to 0.90)	0.84 (0.76 to 0.92)	0.92 (0.82 to 1.03)
5 (most deprived)	1.09 (0.86 to 1.37)	0.72 (0.62 to 0.82)	0.76 (0.68 to 0.85)	0.91 (0.81 to 1.03)

*Odds ratio (95% confidence interval).
†Hazard ratio (95% confidence interval).