The interaction between smoking and medication

Some drugs used to manage mental health conditions can be affected by smoking. The polycyclic aromatic hydrocarbons found in tobacco smoke are inducers of the cytochrome P450 system of drug metabolism in the liver. The effect can be an increase in the metabolism of certain drugs, which in turn, means that a higher dose is required to achieve the same clinical effects. When a patient stops smoking, their dosage may require to be reduced to prevent side effects and/or toxicity. Therefore it is important to monitor dosage levels closely when a patient quits smoking.

Many commonly used medicines, including some psychotropic drugs, possibly interact with smoking (see below), however not all possible drug-smoking interactions are clinically significant.

### Those with established evidence of interaction / of clinical significance

- Aminophylline
- Beta blockers e.g. atenolol, propranolol
- Chlorpromazine
- Cimetidine
- Clozapine
- Diazepam
- Duloxetine
- Erlotinib
- Flecainide
- Fluphenazine
- Haloperidol
- Olanzapine
- Propranolol
- Ranitidine
- Rivastigmine
- Ropinirole
- Theophylline
- Warfarin

### Those with conflicting evidence / of unlikely clinical significance

- Antidiabetic drugs e.g. gliclazide, glibenclamide, metformin, insulin
- Benzodiazepines e.g. diazepam, lorazepam, oxazepam
- Fluvoxamine
- Frovatriptan
- Irinotecan
- Naratriptan
- Tricyclic antidepressants e.g. amitriptyline, clomipramine, imipramine
- Zolpidem
Smoking and clozapine or olanzapine

Clozapine

Clozapine is an atypical anti-psychotic, prescribed for treatment resistant schizophrenia, and schizophrenia in patients who have had neurological adverse reactions to other antipsychotics, and psychotic disorders in Parkinson’s disease. Due to the effects of smoking on the metabolism of clozapine, smokers often require higher doses.

So what happens if a patient taking clozapine quits smoking?

A rough estimation is that smoking cessation may cause a 1.5-fold increase in clozapine levels within 2 to 4 weeks of stopping smoking, although plasma clozapine can rise substantially within 3-5 days of smoking cessation. This figure should not be relied on and monitoring of side effects and the serum level of clozapine is essential. Dose reduction may be required.

Olanzapine

Olanzapine is another atypical antipsychotic, prescribed for schizophrenia, mania and prevention of recurrence of bipolar disorder. Smokers have a 40% greater clearance of olanzapine than non-smokers. Thus the effects of olanzapine will be reduced to some extent by smoking.

So what happens if a patient taking olanzapine quits smoking?

Monitoring of side effects is advisable and dose reduction may be required.

Is the effect of smoking cessation on medication metabolism a problem?

It really shouldn’t be a problem if appropriate liaison is taking place between a patient’s smoking cessation advisor and the clinician prescribing their medication. The effect is particularly important for drugs which have a narrow therapeutic index e.g. aminophylline, theophylline, warfarin. The effect of lowering the required dose of a particular medication may be seen in a positive light for example some drugs used in mental health settings can raise the risk of physical morbidity.

Read more about the effects of smoking and medication Smoking Cessation and Effects on Drug Metabolism from Greater Glasgow and Clyde Health Board, PostScipt 65, September 2011.

http://www.ggcprescribing.org.uk/search/?q=+smoking+cessation

Advice for healthcare professionals

Clear guidelines for clinical practice are not available, however the following general approach is suggested:

On starting a medicine which interacts with smoking:

1. Obtain smoking status.
2. Determine the clinical significance of any potential interaction.
3. Monitor efficacy and side effects of the medication.
4. Adjust dose if necessary.
5. Monitor smoking status and advise patients to seek advice from the doctor if smoking status is to change.
On quitting smoking:
Stopping smoking, with or without the aid of drug treatment, may be associated with psychiatric symptoms, and stopping smoking may also exacerbate an underlying psychiatric condition.

1. Obtain a full list of the medications that the patient is taking.
2. Determine the clinical significance of any potential interaction.
3. Monitor for side effects.
4. Adjust dose if necessary.
5. It takes about one week for the effect of the induction of the liver enzymes to wear off after stopping smoking, and so dose adjustment is not usually needed in situations where there is temporary smoking cessation eg during an acute hospital stay.

The most important medicines to consider in those who smoke or who are trying to quit include aminophylline, theophylline, clozapine, olanzapine and warfarin.

REFERENCES

3. Clozapine Therapeutic Monitoring Notes for Guidance Dr Robert Flanagan et al, Toxicology Unit, Kings College Hospital with Novartis, October 2009.