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Supplementary Materials

Avoiding acute kidney injury in primary care: attitudes and behaviours of general practitioners and community pharmacists in Hawke's Bay

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Supplementary Materials Table S1: AKI project: General Practitioner survey

Community Pharmacists Role in Medicine-Induced Acute Kidney Injury (AKI) Prevention

In Hawke's Bay there are over 700 cases of acute kidney injury (AKI) every year. These patients' hospital admission will be three times as long as the average medical admission and within 3.5 years 50% of these patients will be dead.

Our goal is to reduce the number of medicine-induced acute kidney injury cases in Hawke's Bay due to particular medicines being continued during periods of acute illness. This survey is part of phase one of the project, which seeks to explore current practice, knowledge and views from a number of health providers and patients.

Your feedback will form the first phase of a multi-phase project to investigate the role and value of community pharmacists providing patient education as a means of reducing the incidence of medicine-induced acute kidney injury.

Phase One: Health Professional Survey

1. Community pharmacists

To determine current practices around medicine advice, particularly medicine classes which pose a high risk for acute kidney injury.

2. General Practitioners

To learn the views of general practitioners with respect to community pharmacists role of patient educators on the safe and effective use of medicines; in particular their role on the minimisation of medicine harm, for example, acute kidney injury.

3. Secondary care providers

To determine the advice specialist care team members are providing about the prevention of acute kidney injury, in particular, during periods of acute illness.

Data storage, retention, destruction and future use: All data will initially be stored electronically in the Health Hawke's Bay SurveyMonkey account, and then downloaded into password protected Word or Excel files on Health Hawke's Bay network drive. These files will then only be accessible to be researchers. Data will be deleted following analysis and publication.

Right to withdraw from participation: Participation is voluntary and you have the right to withdraw your participation at any time.

Anonymity and confidentiality: No personal identifying information is being requested in this survey and your answers cannot be linked back to you. Responses and comments will be reported either in an anonymised form (in words) or in aggregated form (for numerical data). It is anticipated that this information will be used in publications and reported at conferences and in other presentations.

Contact details: If you have any questions, or if you require more information about this research, please contact the researchers below.

This project and survey has been endorsed by Dr Mark Peterson, Hawke's Bay District Health Board Senior Medical Officer - Primary and the Health Hawke's Bay PHO Clinical Advisory and Governance Committee.

Many thanks for considering completing this survey. Your time and input are greatly appreciated.

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AKI project: General Practitioner survey

General Practitioner guidance to patients

Medicines are reported to contribute to acute kidney injury (AKI) in approximately 20% of cases. (1) In particular, the 'Triple Whammy' combination of ACE inhibitors (or angiotensin-II receptor antagonist (ARB)), diuretics and NSAIDs (or COX-2 inhibitors) can cause acute kidney injury by interfering with homeostatic mechanisms. (1)

In primary care, acute kidney injury can be caused by hypovolaemia due to an episode of acute illness, for example, upper or lower respiratory tract infection, urinary tract infection, sepsis or gastrointestinal illness. During an acute illness, with an increased risk of dehydration, it may be appropriate for some people to discontinue, or reduce, the dose of potentially nephrotoxic medicines. It may also be appropriate to advise avoiding taking nephrotoxic medicines, including over-the-counter medicines, for example, NSAIDs.

It has been reported that used individually or in combination, ACE inhibitors, diuretics and NSAIDs are involved in over 50% of reported AKI that is directly or indirectly due to medical interventions, and fatalities estimated at 10% with 'Triple Whammy' associated AKI. (2)

Elderly patients taking the 'Triple Whammy' are particularly vulnerable. Kidney injury can occur when patients are stable taking an ACE inhibitor and diuretic, but become acutely unwell (vomiting, diarrhoea, dehydration due to fever) or when an NSAID is added to the regimen.

A 'Double Whammy' is the combination of two of the following medicine classes: ACE inhibitor (or angiotensin-II receptor antagonists), diuretic, or NSAID (or COX-2 inhibitor). Examples include an NSAID plus an ACE inhibitor or diuretic; or a diuretic and an ACE inhibitor.

References:

1. bpacNZ. Acute-on-chronic kidney disease: prevention, diagnosis, management and referral in primary care. Best Practice Journal Issue 46.2012 September [accessed 2014 July 14]. Available from: http://www.bpac.org.nz/BPJ/2012/september/ckd.aspx

2. Australian Adverse Drug Reactions Bulletin [internet]. 2003[accessed 2013 February 7]; 22(4):14-5. Available from: http://www.antidepressantsfacts.com/2003-08-ADRAC-SSRI-neonatal-effects.htm

1. Do you feel you have the knowledge and skills to discuss the topic of medicine use during an acute illness with an increased risk of dehydration, with patients?

◯ Yes ◯ No

If you answered no, please outline what further support you would like:

2. Do you currently recommend to patients prescribed either an ACE inhibitor or an ARB to temporarily discontinue taking this medicine during periods of acute illness with an increased risk of dehydration?

(Reference: NICE clinical guideline 169. Acute kidney injury: Prevention, detection and management of acute kidney injury up to the point of renal replacement therapy. August 2013)

◯ Never ◯ Sometimes ◯ Always

Comments:

3. Do you currently provide patient education to temporarily discontinue NSAIDs or diuretics during an acute illness with an increased risk of dehydration?

◯ Never ◯ Sometimes ◯ Always

Comments:

4. Do you currently provide patient education to temporarily discontinue medicines other than ACE inhibitors, ARBs, NSAIDs or diuretics, during an acute illness with an increased risk of dehydration?

◯ Never ◯ Sometimes ◯ Always

If you have answered 'yes' or 'sometimes' please list the medicines associated with this guidance:

5. When you prescribe an ACE inhibitor (or ARB) AND a diuretic, the advice you provide about self-medicating with NSAIDs is: (Please select ALL that apply)

- I do not provide advice about NSAID use
- I have never considered the risk of NSAID use, so have not provided specific guidance
- I advise patients NOT to take NSAIDs at all
- I advise patients NOT to take NSAIDs during periods of acute illness or dehydration
- My advice changes depending on the age of the patient
- My advice changes depending on the renal function of the patient

Other (please specify)

AKI project: General Practitioner survey

Temporarily stopping medicines when acutely unwell - Pharmacists as educators

The Pharmacist Scope of Practice includes: ***Pharmacists ensure safe and quality use of medicines and optimise health outcomes by contributing to patient assessment and the selection, prescribing, monitoring and evaluation of medicine therapy.***

In 2014, Vision 2020 - Pharmacists and Doctors Working Together was released. The vision statement was developed by the New Zealand Medical Association and the Pharmaceutical Society of New Zealand. Its overarching aim was to encourage pharmacists and doctors to work together in an integrated vision.

6. Do you feel community pharmacists have the knowledge and skills to discuss the topic of medicine use during an acute illness with an increased risk of dehydration with patients?

◯ Yes ◯ No ◯ Unsure

Comments:

7. Do you support community pharmacists advising patients purchasing OTC NSAIDs to avoid this medicine during periods of acute illness with an increased risk of dehydration or if dehydrated?

◯ Yes ◯ No ◯ Unsure

Comments:

8. Do you support community pharmacists advising patients who have NSAIDs supplied on a prescription, to avoid this medicine during periods of acute illness with an increased risk of dehydration or if dehydrated?

◯ Yes ◯ No ◯ Unsure

Comments:

9. Do you support pharmacists advising patients prescribed either an ACE inhibitor or an ARB to temporarily discontinue taking them during periods of acute illness with an increased risk of dehydration?

◯ Yes ◯ No ◯ Unsure

Comments:

10. I support community pharmacists advising patients who have an acute illness with the increased risk of dehydration who are prescribed ONE or MORE of the following medicines:
* ACE inhibitor
* ARB
* NSAID
* metformin
to advise all these patients to: (Please select ALL that apply)

	Yes	No	Unsure
temporarily withhold these medicines and then contact the general practice for guidance about restarting the medicines when the acute illness has resolved	☐	☐	☐
contact the general practice for guidance as soon as the general practice is open (assumption contact is outside of general practice opening hours)			
to seek medical attention immediately (i.e. after hours appointment)	☐	☐	☐
advise only high risk patients to seek medical attention immediately (after hours appointment). High risk patients are those taking a diuretic, or who have CHF or CKD, or are 80 years of age or older, or have signs of dehydration present.			

Comments:

11. NSAID prescribed with either ACE inhibitor (or ARB) OR diuretic ('Double Whammy')

If a patient presented a prescription for an NSAID and s/he was currently prescribed an ACE inhibitor, ARB, or a diuretic, I would expect the dispensing pharmacist to: (Please select ALL that apply)

- Dispense the prescription and give no advice
- Dispense the prescription and when patient collects medicine determine what advice I, as the prescriber, have provided to the patient, particularly in relation to what they should do when they become acutely unwell
- Dispense the prescription and advise the patient to not take the NSAID during acute illness, or if dehydrated
- Dispense the prescription and advise the patient to not take the NSAID and ACE inhibitor (or ARB) during acute illness, or if dehydrated
- Dispense the prescription and advise the patient to ask me at his/her next appointment for guidance on what to do should s/he become acutely unwell (vomiting, diarrhoea, dehydration due to a fever) or dehydrated
- Contact me to highlight the Double Whammy combination before dispensing the prescription

Comments:

12. NSAID prescribed with ACE inhibitor (or ARB) AND diuretic ('Triple Whammy')

If a customer presented a prescription for an NSAID and s/he was currently prescribed an ACE inhibitor (or ARB) and a diuretic, I would expect the dispensing community pharmacist to: (Please select ALL that apply)

- Dispense the prescription and give no advice
- Dispense the prescription and when patient collects medicine determine what advice I, as the prescriber, have provided to the patient, particularly in relation to what they should do when they become acutely unwell
- Dispense the prescription and advise the patient to not take the NSAID during acute illness, or if dehydrated
- Dispense the prescription and advise the patient to not take the NSAID and ACE inhibitor (or ARB) during acute illness, or if dehydrated
- Dispense the prescription and advise the patient to ask me at their next appointment for guidance on what to do should s/he become acutely unwell (vomiting, diarrhoea, dehydration due to a fever) or dehydrated
- Contact me to highlight the Triple Whammy combination before dispensing the prescription

Comments:

13. If a community pharmacist had concerns about a prescription which included the Triple Whammy combination, I would welcome the pharmacist contacting me to discuss his/her concerns.

◯ Yes ◯ No ◯ Unsure

Other (please specify)

AKI project: General Practitioner survey

Demographic Information

14. Age

◯ <30 ◯ 31 - 40 ◯ 41 - 50 ◯ 51 - 60 ◯ > 60

15. Number of years working as a General Practitioner

◯ <5 ◯ 6 - 10 ◯ 11 - 20 ◯ 21-30 ◯ >30

16. Gender:

◯ Male ◯ Female

17. Employment

General Practice owner

Employee working in General Practice

Employee working only in Accident and Medical setting (primary care)

Locum

Other (please specify)

18. Qualifications

Degree

Postgraduate qualifications

Fellow of Royal New Zealand College of General Practitioners

Working towards becoming a Fellow of Royal New Zealand College of General Practitioners

19. Undergraduate provider

- ◯ The University of Otago
- ◯ The University of Auckland
- ◯ Overseas (please provide details below)

Other (please specify)

Supplementary Materials Table S2: AKI project: Community Pharmacist survey final

Community Pharmacists Role in Medicine-Induced Acute Kidney Injury Prevention

In Hawke's Bay there are over 700 cases of acute kidney injury (AKI) every year. These patients' hospital admission will be three times as long as the average medical admission and within 3.5 years 50% of these patients will be dead.

Our goal is to reduce the number of medicine-induced acute kidney injury cases in Hawke's Bay due to particular medicines being continued during periods of acute illness. This survey is part of phase one of the project, which seeks to explore current practice, knowledge and views from a number of health providers and patients.

Your feedback will form the first phase of a multi-phase project to investigate the role and value of community pharmacists providing patient education as a means of reducing the incidence of medicine-induced acute kidney injury.

Phase One: Health Professional Survey

1. Community pharmacists

To determine current practices around medicine advice, particularly medicine classes which pose a high risk for acute kidney injury.

2. General Practitioners

To learn the views of general practitioners with respect to community pharmacists role of patient educators on the safe and effective use of medicines; in particular their role on the minimisation of medicine harm, for example, acute kidney injury.

3. Secondary care providers

To determine the advice specialist care team members are providing about the prevention of acute kidney injury, in particular, during periods of acute illness.

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Contact details: If you have any questions, or if you require more information about this research, please contact the researchers below.

This survey is endorsed by the Pharmacy Guild of New Zealand (Inc) and Green Cross Health.

The last date for completing this survey is 30 September 2015. Many thanks for considering completing this survey. Your time and input are greatly appreciated.

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AKI project: Community Pharmacist survey final

Pharmacists as educators - stopping medicines when acutely unwell

An acute illness where an increased risk of dehydration is present includes dehydration due to fever as the result of an infection such as upper or lower respiratory tract infection, urinary tract infection, sepsis or gastrointestinal illness causing vomiting and/or diarrhoea.

1. Do you feel you could knowledgeably discuss the topic of medicine use during acute illnesses with the potential to cause dehydration with PATIENTS when they are collecting their dispensed prescriptions?

- ◯ Yes
- ◯ No

If you answered no, please outline what further support you would like:

2. Do you feel you have the knowledge and skills to discuss the topic of medicine use during acute illnesses with an increased risk of dehydration with PRESCRIBERS?

- ◯ Yes
- ◯ No

If you answered no, please outline what further support you would like:

3. Do you currently provide PATIENT education on which medicines to temporarily discontinue during an acute illness which has an increased risk of dehydration?

- ◯ Hardly ever
- ◯ Sometimes
- ◯ Usually

4. What actions do you take if a patient with chronic medical conditions presents at your pharmacy with an acute illness which has an increased risk of dehydration?

5. Would you be prepared to advise all patients taking either an ACE inhibitor, or an ARB, to temporarily discontinue them when they suffer an acute illness which has an increased risk of dehydration?

- ◯ Yes
- ◯ No

Comments:

6. Does the potential for a consumer to respond negatively, if you were to decline the sale of an NSAID, influence the education you provide to consumers about the safe use of NSAIDs?

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Frequently
- ◯ Comments:

ACE inhibitor, diuretic, and NSAID (except low-dose aspirin) combination (Triple Whammy)

The 'Triple Whammy' combination of an ACE inhibitor (or angiotensin-II receptor antagonist(ARB)), a diuretic and an NSAID (or COX-2 inhibitors) can cause acute kidney injury by interfering with homeostatic mechanisms. (1)

It has been reported that used individually or in combination, ACE inhibitors, diuretics and an NSAID are involved in over 50% of reported AKI that is directly or indirectly due to medical interventions, and fatalities have been estimated at 10% with 'Triple Whammy' associated AKI. (2)

Elderly patients taking the 'Triple Whammy' are particularly vulnerable. Kidney injury can occur when patients are stable taking an ACE inhibitor and diuretic, but become unwell (vomiting, diarrhoea, dehydration due to fever) or an NSAID is added to the regimen.

A 'Double Whammy' is the combination of two of the following medicine classes: ACE inhibitor (or angiotensin-II receptor antagonists), diuretic, or NSAID (or COX-2 inhibitor). Examples include an NSAID plus an ACE inhibitor or diuretic; or a diuretic and an ACE inhibitor.

The following section of the survey is to gather information on current pharmacy practice and in particular any differences which may occur with the provision of NSAIDs in pharmacy via OTC or Pharmacist-Only sale or supply via prescription.

References:
1. bpacNZ. Acute-on-chronic kidney disease: prevention, diagnosis, management and referral in primary care. Best Practice Journal Issue 46.2012 September [accessed 2014 July 14]. Available from: http://www.bpac.org.nz/BPJ/2012/september/ckd.aspx
2. Australian Adverse Drug Reactions Bulletin [internet]. 2003[accessed 2013 February 7]; 22(4):14-5. Available from: http://www.antidepressantsfacts.com/2003-08-ADRAC-SSRI-neonatal-effects.htm

7. OTC purchase of an NSAID - In my workplace, a customer purchasing an NSAID would be asked about other medicines they were taking, if the sale was processed by a:

	Yes	No	Do not know
Retail staff member	○	○	○
Pharmacy / Dispensary technician	○	○	○
Pharmacist	○	○	○

Comments:

8. If a customer purchasing an NSAID as an OTC sale was asked about other medicines and replied that s/he was also taking an ACE inhibitor (or ARB) and a diuretic, in my workplace the following would usually occur depending on which staff member was the first point of contact:
(Please describe what would happen in spaces below)

Retail staff member

Technician

Pharmacist

9. Pharmacist-Only NSAID - when I am selling diclofenac tablets as a Pharmacist-Only sale, I: (Please select ALL options that apply)

- Never specifically check to see if the person is currently taking either an ACE inhibitor, ARB, or diuretic
- Decline the sale if the person is currently taking either an ACE inhibitor (or ARB) OR diuretic, explaining why (Double Whammy)
- Sell the diclofenac and discuss the risks if the person is currently taking either an ACE inhibitor (or ARB) OR diuretic (Double Whammy)
- Decline the sale if the person is currently taking either an ACE inhibitor (or ARB) AND diuretic (Triple Whammy)
- Sell the diclofenac and discuss the risks if the person is currently taking either an ACE inhibitor (or ARB) AND diuretic (Triple Whammy)

Comments:

10. When I dispense a prescription for either an ACE inhibitor (or ARB), AND a diuretic, the advice I provide about self-medicating with an NSAID, including those purchases in a supermarket or service station, is: (Please select ALL options that apply)

- I do not provide advice about NSAID use, it is not my place
- I have never considered the risk of NSAID use, so have not provided specific guidance
- The patient may collect the dispensed prescription and not speak with a pharmacist, therefore no advice provided
- I advise patients NOT to take NSAIDs
- I do not provide advice when I have not initiated the sale of a NSAID
- I advise patients to check with his/her prescriber regarding the use of NSAIDs
- My advice changes depending on the age of the patient
- I do not provide advice when the patient is unwilling to engage

Other (please specify)

11. If a customer presented a prescription for an NSAID and s/he was currently prescribed an ACE inhibitor (or ARB) OR a diuretic (a 'Double Whammy') I would: (Please select ALL options that apply)

- Have a conversation with the patient prior to dispensing
- Have a conversation with the prescriber before dispensing the prescription
- Dispense prescription and give no advice
- Dispense prescription and ask the patient to contact pharmacist or general practice when acutely unwell for advice
- Dispense prescription and ensure the patient speaks to the pharmacist when medicine collected, to determine what advice the prescriber had given him/her
- Dispense the prescription and advise the patient to discontinue NSAID during acute illness
- Dispense the prescription and advise the patient to ask the prescriber at next visit what to do should s/he become acutely unwell (vomiting, diarrhoea, dehydration with fever)
- I would contact the general practice nurse after dispensing the prescription, to highlight this medicine combination and possible consequences; requesting documentation in the patient notes of my telephone call
- My action would depend on how much time I had available
- My action would depend on the customer (please provide further information below)
- My action would vary depending on the dispensing history (please provide further information below)

Comments:

12. If a customer presented a prescription for a NSAID and s/he was currently prescribed an ACE inhibitor (or ARB) AND a diuretic (a 'Triple Whammy') I would: (Please select ALL options that apply)

- Have a conversation with the patient prior to dispensing
- Have a conversation with the prescriber before prescription dispensed
- Dispense prescription and give no advice
- Dispense prescription and ask the patient to contact pharmacist or general practice when acutely unwell for advice
- Dispense prescription and ensure the patient speaks to the pharmacist when medicine collected, to determine what advice the prescriber had given him/her
- Dispense prescription and I would advise the patient to discontinue NSAID during acute illness
- Dispense prescription and I would advise the patient to ask the prescriber at next visit what to do should s/he become acutely unwell (vomiting, diarrhoea, dehydration with fever)
- I would contact the practice nurse after dispensing the prescription, to highlight combination in the patient notes for future review
- My action would depend on how much time I had available
- My action would depend on the customer (please provide further information below)
- My action would vary depending on the dispensing history (please provide further information below)

Comments:

13. If I had concerns about a prescription which included the Triple Whammy combination, some of the barriers I face are: (Please select ALL options that apply)

- Not applicable - I do not face barriers when contacting prescribers about this combination
- Not applicable - I do not contact prescribers about this combination
- I am unsure if prescribers want pharmacists to contact them
- Patient health / medicine literacy - complicated discussion which is too much for some
- Mistrust - especially when advice varies to that given to the patient by other health providers
- Consistency of advice - difficult updating patient on new information
- Not suitable for all patients, all of the time
- Time barrier for pharmacist to ring prescriber when Triple Whammy prescribed
- Time barrier for pharmacist to educate patient
- Not known if the patient has already had this discussion
- Time / distance for patient to return to the prescriber if this is deemed necessary after pharmacist/prescriber discussion
- I am unsure if prescribers take this interaction seriously
- I am unsure if prescribers what pharmacists to contact / remind them when they prescribe Triple Whammy combination
- I am unsure if I need to discuss the risk of AKI with every patient on an ACE inhibitor, ARB, diuretic, NSAID or Cox-2 inhibitor
- I am unsure if prescribers are monitoring renal function to know when to change long term medicine regimens

Other barriers I face, or the concerns I have, regarding contacting the prescriber about this combination are:

14. If knowledge about the Triple Whammy combination, or medicine-related AKI in general, was one of the barriers you identified in the above question, please list below the additional information you would find valuable on this topic.

AKI project: Community Pharmacist survey final

Demographic Information

15. Age

◯ <30 ◯ 31 - 40 ◯ 41 - 50 ◯ 51 - 60 ◯ > 60

16. Number of years as a practising pharmacist

◯ <5 ◯ 6 - 10 ◯ 11 - 20 ◯ 21 - 30 ◯ >30

17. Gender:

◯ Male ◯ Female

18. Employment

◯ Pharmacy owner / Employer ◯ Employee ◯ Locum

19. My community pharmacy workplace is located (if you work in multiple locations use the location where you work the most hours)

◯ Urban - CBD

◯ Urban - Suburb

◯ Rural

20. Qualifications

Registration qualification

Working towards Postgraduate qualification

Postgraduate qualification

21. Undergraduate provider

- ◯ Central Institute of Technology
- ◯ The University of Otago
- ◯ The University of Auckland
- ◯ Overseas (please provide details below)

Other (please specify)

22. My workplace community pharmacy is located in the following District Health Board (if you work across multiple DHBs please select the DHB in which you work the most time):

- ◯ Auckland District Health Board
- ◯ Bay of Plenty District Health Board
- ◯ Canterbury District Health Board
- ◯ Capital and Coast District Health Board
- ◯ Counties Manukau District Health Board
- ◯ Hawkes Bay District Health Board
- ◯ Hutt Valley District Health Board
- ◯ Lakes District Health Board
- ◯ Mid Central District Health Board
- ◯ Nelson-Marlborough District Health Board
- ◯ Northland District Health Board
- ◯ South Canterbury District Health Board
- ◯ Southern District Health Board
- ◯ Tairawhiti District Health Board
- ◯ Taranaki District Health Board
- ◯ Waikato District Health Board
- ◯ Wairarapa District Health Board
- ◯ Waitemata District Health Board
- ◯ West Coast District Health Board
- ◯ Whanganui District Health Board