Ten-year survey reveals differences in GP management of neck and back pain

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TEN YEAR SURVEY REVEALS DIFFERENCES IN GP MANAGEMENT OF NECK AND BACK PAIN

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ABSTRACT

Objective: To compare and contrast general practitioners (GP) usual management of patients presenting with a new episode of neck pain to the management of those with a new episode of low back pain (LBP) in Australia between April 2000-March 2010.

Design: Cross sectional national survey of GP-patient encounters in Australia.

Setting: General practice.

Participants: All GP-patient encounters for a new (i.e. the first visit to any medical practitioner for the problem) neck pain or LBP problem were included in the analysis.

Main outcome measures: GP's management of new neck and LBP were compared in terms of treatment delivered, referral patterns and requests for laboratory and imaging investigations.

Results: Over the last 10 years GPs in Australia have managed new neck pain and LBP problems at a rate of 3.1 and 5.8 per 1000 GP-patient encounters respectively. GP's primarily utilised medications, in particular non-steroidal anti-inflammatory drugs, to manage new neck and LBP problems and referred approximately 25% of all patients for imaging. Patients with new neck pain are more frequently managed using physical treatments and were referred more often to allied health professionals (e.g. physiotherapists) and specialists. In comparison, patients with new LBP were managed more frequently with medication, advice, provision of a sickness certificate and ordering of pathology tests.

Conclusions: This is the first time GP management of a new episode of neck pain has been documented using a nationally representative encounter sample and it is also the first time that the management of new neck pain and LBP has been compared. Despite guidelines endorsing a similar approach for the management of new neck pain and LBP, in actual clinical practice Australian GPs manage these two conditions differently.

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BACKGROUND

Neck pain and low back pain (LBP) are conditions that are commonly managed by general practitioners (GPs). These conditions present major social and economic burdens due to their prevalence, chronicity and resultant disability.[1] In many countries, including Australia, Netherlands, Denmark and the United Kingdom GPs are identified as the gate keepers of the health care system. They provide first-line care and referrals to medical specialists, allied health care, pathology, imaging and other investigations.[2, 3] Referral patterns have been shown to vary greatly between GPs and this has a large impact on the cost and quality of care patients receive.[4, 5]

While neck pain and LBP are distinct conditions anatomically, the recommendations for the diagnosis and management of these non-specific spinal conditions are remarkably similar.[6] For both conditions routine imaging is not recommended and instead GPs are encouraged to restrict diagnostic work-up to those patients in whom the presence of red flags indicates a higher likelihood of serious spinal pathologies (e.g. fracture or tumor).[6] Key treatment recommendations include reassurance (of the favourable prognosis for non-specific spinal pain), advice (to stay active and avoid bed rest) and analgesia. Paracetamol is recommended as the first line of analgesia as it is well tolerated and has minimal side effects unlike non-steroidal anti-inflammatory drugs (NSAIDs) and stronger opiod mediations. NSAIDs are recommended as an adjunct in cases where paracetamol is insufficient.[7-9] While patterns of GP management are well documented for patients with a new episode of LBP[2] there are no studies which report on GP management of a large and representative group of patients presenting with a new episode of neck pain.[10] A lack of good quality research means that it is currently unclear how GPs manage patients with a new episode of neck pain and if this is similar to how they manage LBP. This study aims to compare GP's usual management of patients presenting with a new episode of neck pain to the management of those with a new episode of LBP. We

considered treatment delivery, referral patterns and requests for laboratory and imaging investigations.

METHODS

We compared GP management of all new presentations of neck pain (including whiplash) and LBP in Australia over a 10-year period (April 2000- March 2010) using the Bettering the Evaluation and Care of Health (BEACH) database. BEACH is a continuous national cross-sectional study of GP activity, involving ever-changing random samples of approximately 1,000 GPs per year (drawn by the Australian Government Department of Health and Ageing from insurance claims data). Each GP participant completes a questionnaire about themselves and their practice, and uses structured paper based encounter forms to record details of 100 consecutive patient encounters. This produces information for approximately 100,000 GP–patient encounters each year. Information collected includes: i) details about the encounter (e.g. date, payment method), ii) patient demographics (e.g. age, sex, postcode, ethnicity etc), iii) up to three patient reasons for encounter and up to four diagnoses/problems managed, iv) whether each problem is (in the GP's opinion) work related, v) the status of the problem to the patient (e.g. a new problem or old problem) and vi) the management provided for each problem during the consultation (including medications, clinical treatments, procedures, referrals and orders for pathology and imaging). Reasons for encounters, problems managed, clinical treatments, procedures, referrals and investigations are classified according to the International Classification of Primary Care-Version 2[11] but coded more specifically with the Australian general practice interface terminology, ICPC-2 Plus.[12] Medications are coded according to an in-house coding system known as the Coding Atlas for Pharmaceutical Substances (CAPS)[13] and mapped at the generic level to the Anatomic Therapeutic Chemical (ATC) classification.[14] Patient geographic location of residence (i.e. major city and non-major city) was categorised according to the Australian Standard Geographical Classification.[15]

Completed encounter forms are returned to the BEACH research team for coding and data entry[16]. Quality control measures are applied regularly[17], for example data for a minimum of one in ten coded forms are checked against the original recording form; data entry (Microsoft Access) and statistical software (SAS version 9.13; SAS Inc, Cary, North Carolina) are also employed to check accuracy and completeness. From its inception in April 1998 to date, the BEACH database contains over 1.2 million records of GP-patient encounters collected from almost half of all the practising GPs in Australia.[18, 19] In 2009-2010 approximately 83% of the Australian population claimed at least one GP service from Medicare with the average person visiting their GP 5.3 times between March 2009 and April 2010.[20] In Australia, payment for GP visits is on a fee-for-service system with the majority of costs covered by Medicare, the universal Australian government funded medical insurance scheme.

Participants

We identified all new (i.e. the first visit to any GP for the problem, or the first visit for a new episode of a recurrent problem) neck pain and LBP GP-patient encounters by searching the BEACH database for specific ICPC-2 Plus terms,[12] as LBP and neck pain problems were spread across a number of ICPC-2 rubrics. The terms and their codes are listed in Appendix 1. We then extracted demographic data on the patients and their GPs and on the management provided for new cases of neck pain and LBP.

Statistical methods

The BEACH study is a cluster sample design with a cluster of 100 patient encounters around each GP. We adjusted the 95% confidence intervals reported for the single stage clustered study design using procedures in SAS statistical software (version 9.1.3 SAS Inc, Cary, North Carolina). Data are presented as a rate per 1,000 patient encounters or as proportions of new

problems for which at least one of the selected management actions was given. Statistical significance of differences between management of new neck pain and new LBP is judged by non-overlapping 95% confidence intervals.

RESULTS

At the 984,200 recorded GP-patient encounters in the 10-year period (April 2000-March 2010), GPs managed LBP at a rate of 21.7 per 1,000 encounters, significantly more often than the rate at which neck pain problems were managed (8.7 per 1,000). More than one third (35.7%) of the neck pain problems managed, and one quarter (26.6%) of LBP problems were new cases. A greater proportion of the new LBP problems were considered by GP's to be work related (6.8% compared to 4% of new neck problems). Approximately 25% of all the participating GPs saw at least one new case of neck pain, and 40% saw at least one new LBP problem in their cluster of 100 encounters. Male GPs managed significantly more new cases of both neck pain and LBP than female GPs. The management rate of new cases of LBP was steady across all GP age groups but the management rate of new neck pain problems significantly increased with GP age group (Table 1).

New neck pain problems were managed at a rate of 3.1 per 1,000 encounters and new LBP problems at almost double the rate, 5.8 per 1,000 encounters (Table 2). Extrapolating this average 10-year rate to the 116.8 million Government paid GP-patient encounters[13] in 2009–10, we estimate that in that year there were about 365,000 encounters for new neck pain, and a further 675,000 for new LBP problems among the 22.16 million people in Australia.[13]

Patient demographic data

While male and female patients presented with similar rates of new neck pain, males presented with marginally higher rates of new LBP. The pattern of the age-specific presentation rates of

new neck pain and new LBP were similar for the two conditions with patients of working age (25-44 years and 45-64 years) having significantly higher presentation rates than younger (0-24 years) and older patients (65+ years). There was no difference in the presentation rate of new LBP problems between patients living in major cities and those living outside major cities, however patients living in major cities had a significantly higher presentation rate of new neck pain problems than those living outside major cities (Table 2).

Management of new spinal pain

Medications

Medications were the treatment most often utilised by GPs to manage patients presenting with a new episode of neck pain and LBP, but at least one medication was advised or prescribed for a significantly larger proportion of patients with LBP (64.5% cf 58.1%). NSAIDs were the medication type most often chosen by the GPs for new cases of both neck pain and LBP, again this medication was selected significantly more often for patients with LBP (36.1%) than for those with neck pain (32.1%). For patients with neck pain GPs used paracetamol more often than opioid medications, however for patients with LBP, opioid medications were equally likely to be selected. All other oral and topical medications were used infrequently for both problems (Table 3).

Other treatments

Therapeutic procedures such as manual therapies/rehabilitation (e.g. application of heat/ice, provision of exercises) were more likely to be provided to patients presenting with a new episode of neck pain, while clinical treatments (largely advice, education and reassurance) were more likely for patients presenting with LBP. Only a small proportion of patients received a sickness certificate but this was nearly twice as likely for patients with LBP (3.1%) than for those with neck pain (1.7%) (Table 2).

Referrals

Patients with neck pain were more commonly referred to allied health professionals (17.6% cf 15.0% for LBP), primarily physiotherapy. Referrals to specialists were infrequent, but were more common for patients presenting with new neck pain (2.4%) than for new LBP (1.3%) (Table 2).

Tests/Investigations

Nearly one in every four patients presenting with neck pain and LBP had imaging ordered, the vast majority being for diagnostic radiology (plain x-rays) while orders for ultrasound and computerised tomography were uncommon. Pathology test orders were infrequent, but were more likely for patients with new LBP (4.2%) than for new neck pain (2.1%) presentations.

DISCUSSION

Over the last 10 years GPs in Australia have seen new neck pain and LBP problems at a rate of 3.1 and 5.8 per 1000 GP-patient encounters respectively. In 2010, this is equivalent to one new GP-patient encounter for LBP for every 33 people in Australia and one new neck pain GP-patient encounter for every 60 people in Australia. The recommendations for the diagnosis and management of new neck pain and LBP are similar. However we found that in clinical practice, apart from the common management choice of medication (NSAIDs) and high imaging order rates, these conditions are in fact managed differently. Patients with new neck pain are more frequently treated with physical treatments and more likely to be referred to allied health professionals (e.g. physiotherapists) and to specialists. In contrast, patients with new LBP are managed more frequently with medication, advice, provision of a sickness certificate and pathology testing.

This is the first time GP management of a new episode of neck pain has been documented using a large representative sample and it is also the first time that the management of new neck pain and LBP has been compared. Strengths of this study include the size of the data set and the rigorous data management procedures employed which means that these findings provide an excellent description of GP-management actions for new episodes of neck and low back pain in Australia.[16] The cross sectional method of data collection using the standardised encounter form may be seen as a limitation of the study due to the absence of condition specific (e.g. pain severity, pain duration) information which limits the number of inferences that can be made between the treatment provided and the symptoms reported (e.g. are stronger pain medications prescribed to patients who report higher levels of pain). Furthermore, procedural and clinical treatments are recorded as free text which may result in an under reporting of these treatments as it requires GPs to recognise that any advice they are giving is a distinct part of the management and should be recorded, however some GPs will not see this distinction believing the advice is part of usual care.

Similar rates of patient-physician consultations for a new episode of neck pain (1-2%[10, 21]) and LBP (2-4%[22, 23]) have been reported from other countries. When comparing the results of this study to GP management which has been previously reported, our results suggest that Australian GPs deliver advice less often and refer patients more frequently for imaging. Previous studies have reported that advice is delivered to up to 97%[10] of patients for new neck pain and to between 32 – 76%[22-25] for LBP. It is important to consider the method in which these data are collected as it can significantly alter the rates reported. As discussed above our study may potentially underestimate the use of advice when compared with other studies that specifically ask whether advice was given (e.g. via a tick box option). We believe that asking specific questions may prime a GP to respond more often than they otherwise would. While the rate of reported advice is much higher elsewhere we have little indication as to the quality of the

advice delivered. For example, Vos et al found that while 97% of patients with a new episode of neck pain received advice, 18% were advised to rest.[10] In Australia, referrals for imaging as identified in this and other studies,[2, 26] were much higher than those previously reported for patients with new neck pain (9%[10]) and new LBP (2-18%[23, 25]). These findings suggest an overutilization of imaging by GPs in Australia, especially in light of the low prevalence (<1%) of serious spinal pathology (fracture, tumour)[27] and of the fact that routine imaging has been shown to not have any influence on clinical outcomes.[28] Overuse of imaging may be due to GPs' fear of litigation, patient request or diagnostic uncertainty. However it does translate into increased personal and societal financial costs, excessive and unnecessary exposure to radiation and personal emotional stress all of which may be reduced through appropriate screening. [6, 29]

Our study identifies that GPs manage new neck pain and LBP differently despite similarities in guideline recommendations for the management of these conditions. In the 10 year sample period GPs managed new LBP twice as often as they did new neck pain and this may partly explain GPs management practices as they may be more confident in managing this condition themselves with medications and clinical treatments such as advice, education and reassurance. In the case of neck pain, the higher levels of procedural treatments involving manual therapy (e.g. application of heat/cold, exercises) and referrals to allied health professionals, (primarily to physiotherapists) and specialists, may reflect GPs' uncertainty in managing this problem. Future research may be directed to explaining these differences, better understanding the influences involved in the clinical decision making processes and identifying factors affecting the implementation of guideline recommendations. Consistent with studies conducted in other countries we found NSAIDs to be the medication most frequently recommended in the management of new neck pain and LBP[10, 22-24, 30] despite the strong association with gastrointestinal side effects.[31, 32] Our study found paracetamol to be the second

most recommended medication for neck pain while it was the third most recommended medication for LBP. Of the opioids used to manage both new neck pain and LBP, the majority were codeine/paracetamol combination medications. The preferential use of medications other than guideline-recommended paracetamol for the management of LBP may reflect GPs' belief that paracetamol is an insufficient form of pain relief for this condition, concerns about patient satisfaction, or be due to patient requests for stronger pain medicines possibly because of the influences of media campaigns advertising pain medications.[33, 34] It is however interesting to note, the infrequent use of muscle relaxants in our study compared to that reported internationally.[23, 30] Muscle relaxants, alone or in combination with other medications, are listed as an optional treatment in some international guidelines which may explain their frequent use in other studies. [7, 9, 23, 30, 35]

Undoubtedly GPs have a large workload and face challenges keeping up to date with guideline recommendations especially in the case of spinal pain, where there is a large degree of uncertainty surrounding the diagnosis and effectiveness of many therapeutic interventions.[4] The breakdown in the translation of guideline recommendations into clinical practice may not be the sole responsibility of GPs but rather reflect an overload of information. Specific issues include multiple guidelines available for the same condition,[7, 9] the extensive detail contained in each, and inefficient and ineffective implementation and dissemination by researchers and governments. It has been suggested that practitioner education should be simplified to contain a few key management messages and be implemented more systematically with emphasis on approaches which are interactive, multifaceted and closely linked to the primary clinical decision making process.[7, 36, 37] Future research is needed to identify the most effective strategies to improve the dissemination and implementation process of guideline recommendations (e.g. through the use of electronic decision aids which are in accordance with guideline

management)[7, 25] and to increase community awareness and knowledge of appropriate neck and low back management.

What this paper adds:

What is already known:

- Clinical guidelines recommend a similar management approach for the diagnosis (discourage routine imaging) and treatment (reassurance, advice, analgesia) of neck and low back pain.
- GP's management of patients presenting with a new episode of LBP is well documented however it is currently unclear how GPs manage patients with a new episode of neck pain.

What this study adds:

- This is the first time GP management of a new episode of neck pain has been documented using a nationally representative encounter sample.
- Despite similar guideline recommendations in general practice neck and low back pain are managed differently.
- Patients with new neck pain are more frequently treated with physical treatments (manual therapy, injection and splinting) and more likely to be referred to allied health professionals (e.g. physiotherapists) and to specialists. While patients with new LBP are managed more frequently with medication (NSAIDS, opiods), advice, provision of a sickness certificate and pathology testing.

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Competing interests: All authors have completed the Unified Competing Interest form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare that (1) ZAM, CH, HB, CWCL, CGM have support from The George Institute for Global Health, The University of Sydney, Australia; Family Medicine Research Centre, School of Public Health, The University of Sydney, Australia for the submitted work; (2) No authors have relationships with companies that might have an interest in the submitted work in the previous 3 years; (3) their spouses, partners, or children have no financial relationships that may be relevant to the submitted work; and (4) ZAM, CH, HB, CWCL, CGM have no non-financial interests that may be relevant to the submitted work.

Ethics approval: Ethics approval for the BEACH program and its continued analysis was obtained for the Human Ethics Committee of the University of Sydney and the Ethics Committee of the Australian Institute of Health and Welfare. No additional Ethics approval was required for the conduct of this study.

Data sharing: no additional data available.

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Table 1: Management rate per 1,000 encounters, proportion of problems that were new and work related, age and sex specific management rates of new presentations of neck pain and lower back pain.

Total encounter sample	984,200			
Total number of GP participants	9,842			
	New neck pain problem		**New lower back pain problems**	
	n	**Rate per 1000 encounters/ proportion (95% CIs)**	**n**	**Rate per 1000 encounters/ proportion (95% CIs)**
Back or neck encounters	8,591	8.7 (8.4–9.0)	21,350	21.7 (21.2–22.1)
Proportion of problems				
–that were new	3,070	35.7 (34.6–36.9)	5,675	26.6 (25.9–27.3)
–that were work-related	794	9.2 (8.5–10.0)	2,559	12.0 (11.4–12.6)
–that were new and work-related	124	4.0 (3.3–4.8)	384	6.8 (6.0–7.5)
Proportion of GPs who managed at least one in their 100 encounters	2,453	24.9% (24.1–25.8)	3,937	40.0% (39.0–41.0)
GP characteristic-specific management of new cases, rate per 1,000 encounters				
Sex				
Male	2,138	3.4 (3.2–3.5)	3,862	6.1 (5.8–6.3)
Female	932	2.7 (2.5–2.9)	1,813	5.2 (5.0–5.5)
Age				
< 35 years	159	2.5 (2.1–2.9)	369	5.8 (5.1–6.5)
35 to 44 years	642	2.8 (2.6–3.0)	1,307	5.7 (5.3–6.0)
45 to 54 years	1,118	3.2 (3.0–3.4)	2,010	5.8 (5.5–6.1)
> 55 years and older	1,140	3.4 (3.1–3.6)	1,959	5.8 (5.5–6.1)
Missing	11		30	

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Table 2: Patient characteristic-specific management of new presentations of neck pain and lower back pain, rate per 1,000 encounters.

	New neck pain		New lower back pain	
Patient characteristic	**Number**	**Rate per 1,000 encounters (95% CIs) (n=3,070)**	**Number**	**Rate per 1,000 encounters (95% CIs) (n=5,675)**
Sex				
Male	1,221	3.1 (2.9–3.3)	2,436	6.1 (5.9–6.4)
Female	1,828	3.2 (3.0–3.3)	3,177	5.5 (5.3–5.7)
Missing	21		62	
Age				
0-24	473	2.3 (2.1–2.5)	699	3.4 (3.1–3.6)
25-44	931	3.9 (3.7–4.2)	1,766	7.5 (7.1–7.9)
45-64	1,015	3.8 (3.5–4.0)	1,946	7.3 (6.9–7.6)
65+	629	2.4 (2.2–2.6)	1,231	4.7 (4.4–4.9)
Missing	22		33	
Major city residence*	2,189	3.3 (3.2–3.5)	3,825	5.8 (5.6–6.0)
Rural residence*	811	2.7 (2.5–2.9)	1,704	5.7 (5.4–6.0)
Total	**3,070**	**3.1 (3.0–3.2)**	**5,675**	**5.8 (5.6–5.9)**

* Defined according to the Australian Statistical Geographic Classification[15]

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Table 3: GP management of new neck pain and LBP problems, proportion of problems that receive at least one of the listed management actions at encounter (CI%)

Management action	New neck pain problem % (95% CI) (n=3,070)	New low back pain % (95% CI) (n=5,675)
Medication advised or prescribed	58.1% (56.1-60.1)	64.8% (63.3-66.2)
NSAID*	32.1% (30.3-33.8)	36.1% (34.7-37.5)
Opioid total	11.5% (10.4-12.7)	18.6% (17.5-19.7)
Codeine/Paracetamol †	7.7% (6.7-8.7)	11.9% (11.0-12.8)
Paracetamol	15.8% (14.4-17.1)	17.1% (16.0-18.2)
Diazapam	3.2% (2.5-3.8)	2.3% (1.9-2.7)
Topical (musculoskeletal)	3.7% (3.1-4.5)	2.8% (2.3-3.3)
Muscle relaxants	0.3% (0.1-0.5)	0.1% (0.0-0.2)
Clinical treatments‡	20.3% (18.6-21.8)	23.1% (21.9-24.3)
Sickness certificate	1.7% (1.2-2.1)	3.1% (2.6-3.6)
Procedures §	25.1% (23.3-27.0)	18.5% (17.3-19.2)
Referrals (all):	20.3% (18.8-21.8)	16.5% (15.5-17.6)
Allied health provider	17.6% (16.1-19.0)	15.0% (14.0-16.0)
Physiotherapy	16.1% (14.7-17.5)	13.9% (12.9-14.9)
Specialists	2.4% (1.8-2.9)	1.3% (1.0-1.6)
Imaging orders	22.8% (21.3-24.4)	24.1% (22.9-25.3)
Diagnostic radiology orders	17.1% (15.7-18.5)	19.2% (18.1-20.3)
Pathology tests orders	2.1% (1.6-2.6)	4.2% (3.7-4.7)

* NSAID—non steroid anti-inflammatory agent
† Codeine/paracetamol includes all combinations of codeine and paracetamol
‡ Clinical treatments include advice, education, counselling, reassurance, administration
§ Procedures include all physical treatments (i.e. manual therapy, injection and splinting)

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