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Long-term effectiveness of a multifaceted intervention on pain management in a walk-in clinic

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Summary

Background: Pain is a common complaint of patients attending walk-in clinics, but timely and appropriate pain management is often lacking.

Aim: To evaluate the impact of a multifaceted intervention on pain management.

Design: Prospective interventional study.

Methods: Three cross-sectional surveys were conducted: before, 4 months after and 14 months after a multifaceted intervention at the medical walk-in clinic of a university hospital. The intervention included both educational activities and structural changes. Use of recommended pain management procedures, pain relief and overall assessments of pain treatment and health professionals' attitudes were assessed using patient questionnaires, collected by mail. History of pain, records of pain intensity and use of pain medication were extracted from medical files.

Results: We analysed 1409 medical files and 695 questionnaires of patients presenting with pain. Documentation of pain intensity and administration of pain medication at the walk-in clinic improved significantly 14 months after the intervention (7% vs. 53% and 17% vs. 27%, respectively, $p < 0.001$) and pain medication was more often administered by the oral route (14% vs. 23%, $p < 0.001$). However, no change was observed for complete pain relief (40% vs. 39%, $p = 0.92$) or patients' overall assessments of pain management.

Discussion: The intervention improved adherence to recommended procedures, even in the longer term, but did not result in better patient outcomes. Continuing efforts are needed to help health professionals improve pain management in out-patient care.

Introduction

Pain is a common complaint in patients attending the emergency department.^{1,2} However, timely and appropriate pain relief remains uncommon for several reasons: pain management is often not seen as a priority by physicians and nurses;³ health-care professionals tend to underestimate the level of pain experienced by patients;^{4–6} health-care professionals sometimes choose inappropriate analgesics or inadequate doses of analgesic agents;^{3,7} and fear that analgesia may interfere with making

a diagnosis sometimes prevents health-care professionals from administering adequate types and doses of analgesic.^{8,9}

In many countries, walk-in clinics are used in emergency departments, to decrease the burden of unscheduled and non-urgent care to patients, particularly outside of regular working hours and on weekends.¹⁰ Little is known about pain management practices in such settings. Local unpublished data collected in 1998 at the walk-in clinic of the

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University Hospitals of Geneva, Switzerland, showed that pain was a common complaint among out-patients presenting at this clinic (82%), and was poorly managed in terms of pain recognition (24%) and relief (44%). Accordingly, in 2002, an institutional program aiming at improving pain management was initiated.¹¹ A committee was created that included representatives of all departments and pain management specialists, aiming to support initiatives in several different hospital departments to improve pain management. Its first actions were to generalize the use of validated pain assessment tools, and to improve the information available to both patients and health-care professionals about pain and its management. As part of the institutional program, a multi-faceted intervention, including educational and structural changes, was specifically designed for the walk-in clinic. We hypothesized that training of health professionals in pain management, and organizational changes at the walk-in clinic, would lead to better recognition of patients' level of pain and increased use of pain medication. We now report the changes that occurred in the first 30 months of the program.

Methods

Setting

The study was conducted at the University Hospitals of Geneva, Switzerland, a 2200-bed public teaching hospital, in the medical walk-in clinic, located in the emergency department building. Patients attend the emergency department either spontaneously or when referred by their primary-care doctor, and are triaged by specialized nurses to either the walk-in clinics (medical or surgical) or the emergency rooms, according to the severity of their complaints. The walk-in clinic provides ambulatory care to ~15 000 patients every year, and is open from 0800 to 2300 h, 7 days a week. Fewer than 10% of the patients are hospitalized. Care is delivered by residents ($n=18-20$), generally enrolled in a 12-month training program in primary-care medicine at the end of their residency training as general internists or generalists, which lasts 5 years for both specialties. The residents spend 1-2 days per week at the medical walk-in clinic, and the remaining days at the medical out-patient clinic, where they have planned visits. They are supervised by senior hospital doctors or attending community-based physicians. The nursing staff is composed of registered nurses ($n=5-7$) and medical assistants ($n=2$), who have long-term contracts.

Prior to the intervention, a needs assessment was conducted by a multidisciplinary team of pain specialists, nurses and primary care physicians at the walk-in clinic, through observations of patient care and group discussions with the nursing staff. The following problems were identified: lack of systematic documentation of pain by the clinic nurses at admission; low use of pain medication before the medical consultation for patients presenting with pain; lack of documentation of pain intensity and pain history in the medical file; lack of continuity in nursing care (nurses worked on request, without being responsible for a given patient during his/her stay at the medical walk-in clinic); and rapid turnover of medical staff.

Interventions

Based on the needs assessment evaluation, the following objectives were defined to improve pain management; to include pain assessment as the fifth vital sign for all patients; to increase the use of pain medication prior to and during the medical consultation; and to promote availability of medical and nursing staff and increase their awareness towards pain management. To achieve these objectives, the planned intervention included both an educational program and organizational changes, because traditional educational programs which focus on health-care professionals' knowledge about analgesics and understanding of their indications do not support rapid recognition and treatment of pain.¹² Multi-faceted interventions focusing on structural and process-related aspects of pain management are considered to be more efficient ways to change patterns of pain management than traditional educational programs.¹²

Educational program

The educational intervention was delivered to all physicians, nurses and medical assistants working at the walk-in clinic, since changes in practice are more likely to occur when multiple caregivers are involved in education programs.^{13,14} The educational program was based on a 3-h training on pain assessment and management for physicians and nurses, and distribution of written recommendations on acute pain assessment and management of out-patients. It took place in February and October 2004, and March 2006.

The first hour aimed at making health professionals aware of their clinical practices in pain management and showing them local data on pain management. A 9-min video showing how a patient with pain was commonly managed in the walk-in clinic was presented. Participants were

asked to identify positive and negative aspects of pain management, and decide which ones they considered the most important. During the second hour, experiential learning in small group was performed through role playing and feedback with simulated patients in different scenarios (acute abdominal pain, fibromyalgia and low-back pain). During the last hour, pharmacological aspects of analgesia were addressed through presentation of different clinical cases with the participation of a clinical pharmacologist. The video was again used in June 2004 for a 45-min course to physicians only. Nursing staff meetings were initially organized on a monthly basis to review every-day practices in pain management and identify ways to improve them over a 6-month period. In 2005, the nursing leader of the walk-in clinic initiated a regular monitoring of pain intensity and history documentation in medical records, with discussion of the findings with the nursing team.

Organizational changes

Visual analogue scales were made available in February 2004 to all health-care professionals working at the medical out-patient clinic. At the same time, the medical file was modified with the introduction of rubrics for pain as a fifth vital sign and pain history (duration, location, intensity, provoking factors). In January 2005, interpersonal continuity in nursing care was implemented, with the identification of a single responsible nurse for each patient.

Study design and sample

Pre- and post-intervention evaluations were conducted over a 15-month period from January 2004 to April 2005. All patients aged >18 years living in Switzerland who were admitted to the walk-in clinic in January 2004 ($n=894$), during the first two weeks of June 2004 ($n=510$) and during the first two weeks of April 2005 ($n=569$) were eligible. As a quality improvement project involving minimal risk to participants, it was exempted from formal review by the hospital's research ethics committee.

Measures and data collection

To evaluate the impact of our intervention, we chose to assess both practice patterns and patient outcomes in a comprehensive evaluation of the quality of pain management.¹⁵ This choice implied to review medical files and obtain patients' reports to draw an overall picture of pain management processes.

Medical files

Medical files were reviewed by a research nurse to document changes in pain assessment and use of pain treatment. The following information was collected: pain assessment with a visual analogue scale (VAS) by the walk-in clinic nurses before and after administration of a treatment to relieve pain, location and duration of pain, record of pain history in the medical file by walk-in clinic nurses, and administration and route of administration of pain treatment while at the walk-in clinic. Data were abstracted by a research nurse and continuously checked for consistency by one author (NJP) on random samples of medical files to ensure inter-rater reliability, but no measure of agreement was computed.

Patients' reports

Patients' reports included questions about the use of recommended pain management procedures, overall satisfaction with pain management and pain relief. Eligible out-patients were surveyed by mail 4–6 weeks after their visits at the walk-in clinic. The questionnaire contained specific items of the Picker instrument (P), a validated patient satisfaction questionnaire,^{16,17} and new items (N) developed by members of the Geneva Hospitals Pain Management Network.¹⁸ The following pain management procedures were measured: availability of doctors and/or nurses (P), regular pain assessment (N), use of a pain assessment tool (N), administration of a treatment to relieve pain prior or during the medical examination (N), modification of pain treatment in case pain was not relieved (N), waiting time <10 min before a requested pain medication was brought to the patient (P), and delivery of information about pain and its management (N). Patient's overall assessment of pain medication received during consultation (P) and patient's overall assessment of health care professionals' attitude toward pain (P) were used as overall assessment of pain management. A final question asked about self-reported pain relief (N).

Statistical analysis

Descriptive statistics (frequency tables, mean, standard deviation, quartiles) were used to describe socio-demographic characteristics of the patients. Only patients whose files or answers to the questionnaire mentioned pain, pain intensity or administration of a treatment against pain were selected. Changes before and after the introduction of the program were assessed using cross-tabulations and linear trend tests, based on the assumption that changes would continue to occur over time at the

same rate. All statistical tests were two-tailed, with a significance level of 0.05.

Results

Of the 1929 visits to the walk-in clinic during the different study periods, 104 medical files could not be located (5%) and 1825 were reviewed. Patients with missing files were more likely to be aged >65 years (14% vs. 5%, $p < 0.001$) and male (75% vs. 44%, $p = 0.03$). The mean age of the patients whose medical files was reviewed was 38 years (SD 15) and 56% ($n = 1028$) were women. The majority were European (Swiss 33%, European Community 27%, other European countries 6%), 14% were of African origin, 10% came from the Americas, and 6% from Asia. A quarter had visited the walk-in clinic during week-ends (26%). The mean time spent at the walk-in clinic was 140 min (SD 91), and 27% of the patients were seen directly by a senior doctor.

Procedures documented in medical files

Based on the medical files, 77% of these patients reported pain during their visit. Assessment of pain intensity with a visual analogue scale improved significantly over the 14 months (Table 1). Documentation of pain history also dramatically improved shortly after the introduction of the program. Use of pain treatment increased,

particularly paracetamol/acetaminophen and non steroidal anti-inflammatory drugs, but slowed down over time. The use of oral medication increased, while intramuscular injections decreased. A review of 178 medical files of patients presenting with pain conducted in October 2006 showed that documentation of pain intensity and pain history was still improving (72% and 76% respectively).

Procedures reported by patients

Of the 1825 patients, 1638 were eligible for the different surveys: 775 for the first assessment before the introduction of the program, 398 for the second assessment 4 months later, and 465 for the third assessment 14 months later. After two reminders, 59%, 56% and 52% of the eligible patients, respectively, returned the questionnaire (trend test $p = 0.02$). No differences in patients' socio-demographic characteristics were found across the different surveys. Pain was reported as severe by 58%, moderate by 32%, and mild by 11%, with no significant differences over time.

The use of a visual analogue scale to assess pain intensity was the only change that improved significantly over time (Table 2). The following pain management procedures and patients' overall assessment of pain management increased 4 months after the intervention but not thereafter: administration of a pain treatment, availability of medical doctors and patient's overall assessment of health care professionals' attitude toward pain. Inversely,

Table 1 Changes in pain management procedures before and after the introduction of a quality improvement program of pain management in a walk-in clinic ($n = 1409$)

	Before	After (4 months)	After (14 months)	p^*
<i>Assessment of pain intensity with a visual analogue scale</i>				
At the walk-in clinic	48/653 (7.4%)	177/337 (52.5%)	180/419 (43.0%)	<0.001
After treatment at the walk-in clinic	3/653 (0.5%)	2/337 (0.6%)	7/419 (1.%)	0.04
Pain history recorded by walk-in clinic nurse in the medical file	–	169/337 (50.1%)	217/419 (51.8%)	<0.001
<i>Use of a pain treatment</i>				
Paracetamol	113/653 (17.3%)	61/337 (18.1%)	115/419 (27.4%)	<0.001
Non-steroidal anti-inflammatory drugs	35/653 (5.4%)	29/337 (8.6%)	42/419 (10.0%)	0.004
Weak opioids	45/653 (6.9%)	27/337 (8.0%)	57/419 (13.6%)	<0.001
Potent opioids	10/653 (1.5%)	7/337 (2.1%)	10/419 (2.4%)	0.59
	1/653 (0.2%)	1/337 (0.3%)	3/419 (0.7%)	0.14
<i>Route of administration</i>				
Oral (tablets)	89/653 (13.6%)	44/337 (13.1%)	95/419 (22.7%)	<0.001
Intramuscular injection	12/653 (1.8%)	4/337 (1.2%)	2/419 (0.5%)	0.05
Intravenous injection	13/653 (2.0%)	9/337 (2.7%)	15/419 (3.6%)	0.11
Subcutaneous injection	1/653 (0.2%)	2/337 (0.6%)	4/419 (1.0%)	0.07

Data were extracted from medical files. The first assessment was conducted during the 4 weeks preceding the introduction of the quality improvement programme, the second 4 months after, and the third 14 months after. *Linear trend test. Numbers do not sum to 1409 because of missing values.

administration of a pain treatment before the medical examination decreased after 4 months but increased after 14 months. Overall, patient self-assessment of pain management outcomes did not improve over time (Table 3).

Discussion

Fourteen months after the introduction of a quality improvement program in pain management, several pain management procedures had improved in ways

Table 2 Changes in self-reported use of recommended pain management procedures among patients consulting a walk-in clinic, before and after the introduction of a quality improvement program of pain management ($n=703$)

	Before	After (4 months)	After (14 months)	p^*
Regular assessment of pain	247/342 (72.2%)	122/168 (72.6%)	136/181 (75.1%)	0.50
Use of a pain assessment tool to assess the pain intensity	135/337 (40.1%)	82/169 (48.5%)	108/177 (61.1%)	<0.001
Administration of a treatment to relieve pain	163/343 (47.5%)	97/171 (56.7%)	83/181 (45.9%)	0.99
Administration of a treatment before the medical examination	43/156 (27.6%)	19/91 (20.9%)	29/78 (37.2%)	0.24
Modification of treatment in case pain was not relieved	39/80 (48.8%)	18/35 (51.4%)	21/38 (55.3%)	0.51
Waiting time less than 10 minutes before receiving a pain medication	71/136 (52.2%)	39/78 (50.0%)	43/73 (58.9%)	0.42
Oral route of administration of the pain medication	144/175 (82.3%)	65/83 (78.3%)	78/92 (84.8%)	0.73
Information about pain and its management	146/336 (43.5%)	56/166 (33.7%)	79/181 (43.6%)	0.82
Information about how to manage pain after discharge	182/337 (54.0%)	77/161 (47.8%)	90/177 (50.8%)	0.97
Timing of pain medication	188/347 (54.2%)	89/171 (52.0%)	100/185 (54.1%)	0.92
Stand-by treatment for pain	83/347 (23.9%)	45/171 (26.3%)	46/185 (24.9%)	0.75
How and when to contact a doctor	97/347 (28.0%)	50/171 (29.2%)	49/185 (26.5%)	0.78
Very good or excellent availability of medical doctor	143/344 (41.6%)	83/169 (49.1%)	66/180 (36.7%)	0.47
Very good or excellent availability of nurses	133/338 (39.3%)	74/163 (45.4%)	71/180 (39.4%)	0.82

The first assessment was conducted during the 4 weeks preceding the introduction of the quality improvement programme, the second 4 months after, and the third 14 months after. *Linear trend test. Numbers do not sum to 703 because of missing values.

Table 3 Self-reported patient satisfaction with pain management after consulting a walk-in clinic, before and after the introduction of a quality improvement program of pain management ($n=703$)

	Before	After (4 months)	After (14 months)	p^*
<i>Overall, have you received enough pain medication during your consultation at the walk-in clinic? (Picker)</i>				
Not enough	55/207 (26.6%)	18/88 (20.5%)	36/115 (31.3%)	0.62
Enough	145/207 (70.0%)	68/88 (77.3%)	74/115 (64.3%)	
Too much	7/207 (3.4%)	2/88 (2.3%)	5/115 (4.3%)	
<i>Do you think that the staff of the walk-in clinic did everything to relieve you from pain? (Picker)</i>				
Yes, definitely	157/331 (47.4%)	94/165 (57.0%)	88/178 (49.4%)	0.64
Yes, to some extent	112/331 (33.8%)	43/165 (26.1%)	56/178 (31.5%)	
No	62/331 (18.7%)	28/165 (17.0%)	34/178 (19.1%)	
<i>Overall, was your pain relieved during your visit at the walk-in clinic?</i>				
Yes, definitely	130/326 (39.9%)	66/160 (41.3%)	66/170 (38.8%)	0.92
Yes, to some extent	111/326 (34.0%)	56/160 (35.0%)	59/170 (34.7%)	
No	85/326 (26.1%)	38/160 (23.8%)	45/170 (26.5%)	

The first assessment was conducted during the 4 weeks preceding the introduction of the quality improvement programme, the second 4 months after, and the third 14 months after. *Linear trend test. Numbers do not sum to 703 because of missing values.

suggested by the prior needs assessment. Use of a visual analogue scale and documentation of pain history by nurses was increased. More pain treatments were administered, and as recommended, more oral treatments were given, with fewer intramuscular injections.

The intervention was modest and inexpensive, could be easily replicated in other similar settings, and did not rely on a local champion or a specific structure. Changes also occurred despite rapid turnover of health professionals in the clinic, contrasting with a recent systematic review of quality improvement strategies for antibiotic selection for out-patients, where changes were much smaller when >10 clinicians were involved,¹⁹ and despite the lack of strong inter-professional leadership at project initiation, a key element of hospital-based quality improvement programs.²⁰

These process improvements resulted almost exclusively from changes in nursing patterns of practice: assessment of pain intensity and pain history. Our nurses have a long-term contract, and staff stability is known to be a positive predictor of involvement in quality improvement projects.²¹ The nurses were also regularly audited and received regular feedback on their performance by the nursing leader, an approach considered to be the backbone of successful quality improvement initiatives.²²

However, despite these improvements in aspects of pain management, there was no change in patient outcomes. Several explanations can be suggested for this result. Pain was already a recognized issue prior to the educational intervention: 50% of patients received pain treatment at the clinic, of whom 70% considered their dose adequate. Our intervention may have been inadequate to improve these aspects of pain management, despite the changes in process. Some trends of improvement observed in the second survey (e.g. administration of a treatment to relieve pain, availability of medical and nursing staff) may have decreased after a period of time;²³ two published reports on pain management processes and/or outcomes at the emergency department assessed changes for only 1–3 months after the educational intervention.^{24,25} Patient outcomes are often less responsive to improvement efforts and more prone to bias than process measures;²⁶ to what extent this reflects difficulties in measurement, rather than lack of effect, is often unclear. Earlier pain management studies have also improved processes without improving patient outcomes such as pain relief.^{15,27,28} Finally, there are probably limits to the pain relief achievable in a walk-in clinic where patients stay only for a limited period of time.

Strengths

We studied a fairly large number of patients, and focused on pain management processes and outcomes obtained from both medical files and patients' reports. Measurements of pain management outcomes and processes were collected three and four times respectively, and over a reasonably long period of time to avoid any 'honeymoon effect' from the intervention. Our measures integrated many of the quality indicators recommended by the American Pain Society, reflecting many aspects of pain management.²⁹

Weaknesses

Despite two recalls, our rate of non-respondents remained high (43%) and fairly constant. This may have biased the results, as non-responders might have had different opinions about pain management. Encouragingly, data obtained from medical files and patients' reports showed similar results regarding an increase in the use of a visual analogue scale, although this is one of the less subjective measures. Any response bias occurred, is likely to be the same over the three surveys, as the same methodology was used. The survey questionnaire was filled in by patients some weeks after their visit to the walk-in clinic, raising the issue of the recall bias, and experiences of pain and anxiety during the consultation may affect patients' perceptions and memories of the actual events.

Future areas for improvement

Our results suggest insufficient collaboration between nurses and physicians: nurses improved their working practices with regard to pain assessment, while physicians did not, although staff turnover rates are also a likely factor. Collaboration and cooperation of staff across professions is recommended for the success of all improvement activities.³⁰ Outside the yearly structured educational activities during the project, physicians, nurses and medical assistants of the medical walk-in clinic did not meet on a regular basis and therefore did not have the opportunity to examine and reflect on their skills and attitudes on team work, especially with respect to pain management. We recommend integration of regular inter-professional meetings in clinical activities of the walk-in clinic, to enhance inter-professional collaboration, team commitment and cohesion, and decrease the negative effect of rapid turnover of physicians.²¹

Implementation of such meetings requires both organizational and cultural adjustments, since nursing and medical staff often have different work

schedules and routines, and share different values and perspectives of care.³¹ Closer collaboration between nursing and medical leaders is needed to overcome such barriers. Furthermore, inter-professional leadership may act as role modelling to promote collaborative staff attitudes and practices.

Group learning and reflection on work practices is also facilitated when audit and feedback are regularly performed on team practices.³² Our data collection and reporting system was neither easy to integrate in clinicians' usual workload, nor easy to interpret. Some of the indicators of quality of care included in the patients' surveys did not provide precise feedback about what health professionals were actually doing, or how they were reacting to patients' expectations. Close monitoring of pain assessment documentation in the medical files led to an increase of such processes over two years. As a next step, we will document in medical files patients' expectation for pain treatment before or during consultation, since distribution of medication remained quite low despite the increase of pain intensity and pain history assessments. This new indicator may further facilitate inter-professional collaboration since administration of pain treatment requires intervention of both nursing and medical staff. We also plan to repeat our patient survey every 2–3 years, and question patients directly after the consultation, both to avoid recall bias and to document communication problems with patients who are not fluent in French.

Conclusion

Improving pain management remains challenging and our multi-faceted program did not act as a 'magic bullet'. Although our process improvements did not translate into improved outcomes, we hope that the program has helped change attitudes to pain management in this setting, particularly by establishing quality measures that give medical and nursing staff more relevant feedback about their work. Continuing efforts are still needed to help health professionals improve pain management in out-patient care.

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