The Influence of Postoperative Telephone Calls on Pain Perception: A Study of 118 Periodontal Surgical Procedures

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This age-matched and sex-matched study examined the influence of postoperative telephone calls on pain perception and on the number of analgesics used for pain relief. Adult periodontitis subjects (n = 118) received periodontal surgery after examination and sanative therapy (scaling, root planing, and removal of local irritants). All subjects received similar care, postoperative instructions, and medication, except 59 subjects were phoned 24 hours postoperative (PC group), and 59 were not (NC group). Callers covered 10 points and were reassuring and positive about surgical outcomes. One week postoperative, subjects completed a questionnaire that rated pain intensity on a visual analogue scale and indicated the number of pills used and whether they had been called. Pain and analgesics used were significantly decreased in the PC group ($P < 0.001$) compared to the NC group. A significant positive correlation was found between pain and pills used in the groups combined ($r = 0.79$, $P < 0.001$ PC + NC), and in the groups separately ($r = 0.50$, $P < 0.001$ PC; $r = 0.41$, $P < 0.01$ NC). Postoperative communication between healthcare providers and patients significantly reduces pain perception and number of analgesics used for relief.

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Pain is a complex rather than a simple sensory modality.[1] Pain may be subjectively distressing, especially if the sufferer cannot explain or comprehend its origin.[2] As complicated anatomic structures, the head and neck juxtapose with and embrace the brain, and cranial and cervical nerves provide the brain with somatosensory afferent information from the jaws and face.[3] For example, head and neck pain is mediated via cranial and cervical nerves.[4] Pain is conducted by nerve pathways that are largely distinct from those of touch, pressure, and temperature, so that stimulation and perception of pain reflect a specific sensory modality.[4]

Individuals become alarmed with pain, as it may be a warning signal that something threatens their functional integrity. Individual pain thresholds are influenced by past experience and patient behavior, and by both emotional and psychologic factors.[5–7] Pain perception thresholds (the lowest intensity of pain perceived under constant conditions) are fairly stable in the same individual and from person to person, whereas pain reaction thresholds (the levels at which a person reacts to pain) are variable.[7] Pain perception and

reaction are affected by many factors including personality, psychology, culture, anticipation, apprehension, attention or distraction, hypnosis with suggestion, and reassurance.[8] Pain tolerance is not the same as pain perception, in that pain can be perceived yet tolerated more by some individuals than by others. Pain tolerance and reaction depend on the subject and the nature of the pain stimulus.

An important factor that affects reaction to pain is its actual or feared significance.[8] Body physiology is altered when an individual interprets situations as adverse or threatening. The physiologic responses to emotional or psychologic stimulation are autonomic and are ultimately controlled by the central nervous system (the brain). Stimulation of the reticular formation induces cerebral arousal and an alerting reaction; the further stimulation of the reticular formation gives rise to panic and fear responses that impact the perception and interpretation of pain.[9]

Postoperative pain is among the many possible reactions to outpatient orodental surgery in any hospital setting or private practice. Healthcare providers use different approaches to manage this reaction.[10–13] For example, analgesics such as acetaminophen in combination with codeine, topical anesthetics, and preoperative preparations are frequently used to control postoperative pain.[14–17] Another important variable of pain management is whether the clinician who performs orodental/dento-alveolar surgery provides postoperative drugs, reassurance, and encouragement.[18–21] The purpose of this study was to determine whether telephone consultation influenced patients' perception of and reaction to pain after periodontal surgery.

Materials and Methods

Subjects

Patients who presented to the McGill University Division of Periodontology at the Montreal General Hospital, Quebec between 1991 and 1995, and who fulfilled specific inclusion criteria were admitted into the study. The inclusion criteria were:

- Moderate to severe periodontal disease (Community Periodontal Index of Treatment Needs [CPITN] Class III and IV, diagnosed as adult cause-related periodontitis)[20,22]
- Root planing and subsequent periodontal surgical pocket reduction, or prescribed elective preprosthetic periodontal surgery
- Systemic health
- No history of mental disease
- Age 30 to 70 years
- No medication for at least 1 month prior to the periodontal surgical procedure (PSP)

In total, 152 patients were eligible for the study, of which 118 were finally studied. These subjects were age-matched and sex-matched for division into two groups: a control group (n = 59) in which patients were not called (NC), and an experimental group (n = 59) in which patients were called (PC).

Clinical Examination

All subjects had undergone a comprehensive periodontal examination that included a medical and dental history, an extraoral and intraoral exam, a full mouth periapical radiographic survey, and detailed notations for all teeth that included information about missing teeth, occlusal contacts, impactions, periodontal probing pocket depths, mobility, furcal involvements, gingival recession, abfractions, vitality tests, new decay formation, defective restorations, Plaque and Bleeding Indices, and any incidental pathologic findings such as retained roots and cysts. Sanative treatment plans that included scaling and root planing with curettes under local anesthetic were implemented prior to all surgeries. Subjects received detailed oral hygiene instructions, full mouth scaling, and/or root planing of existing pockets. After a healing period of at least 10 to 12 weeks for root planing, or 3 weeks for preprosthetic cases, PSPs were performed under local anesthetic by specialist periodontal tutors assisted by undergraduate senior dental students. All subjects had to prove proficiency in plaque control by attaining a Plaque Index of less than 10% prior to the PSP. All PSPs were sutured with silk and periodontal packs were placed over the wounds.

Protocol

Written postoperative instructions were the same for all patients. An antiseptic mouthwash (1 tablespoon chlorhexidine 0.12% twice a day) and 12 analgesic tablets (composed of acetaminophen 300 mg + caffeine 15 mg + codeine-phosphate 8 mg to be taken when necessary, but no more than two pills in 4 hours) were prescribed. Patients were told to expect "some pain and swelling." The instructions stated that patients were to return 1 week later for dressing and suture removal, and that they should call the clinic if there was bleeding or if they had any problems. Subjects were ignorant as to

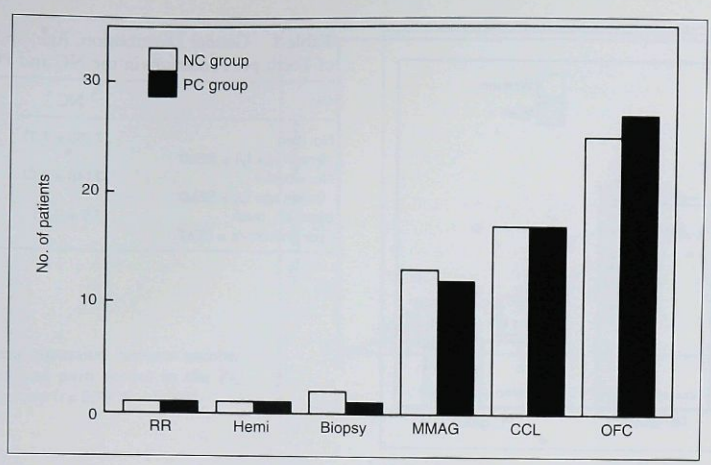

Fig 1 Distribution of surgical procedures in the control (NC) and experimental (PC) groups. RR = root resection; Hemi = hemisection; Biopsy = mucosal biopsy; MMAG = masticatory mucosal free gingival autograft; CCL = clinical crown lengthening; OFC = open flap curettage for pocket reduction and root planing.

whether they would be called the next day, and they were unaware that a phone call was part of a clinical research study.

The PC group patients were called no later than 24 hours after the PSP, between 7:00 AM and 8:00 AM. The telephone interviewer was either the assisting student, or when not feasible the supervisor, who then systematically inquired about 10 points: the well-being of the patient; the return to normal and loss of analgesia; jaw swelling; wound bleeding; whether the wound was painful; acquisition and use of the mouthwash and analgesics; the need for a soft balanced diet; the necessity of sustained oral hygiene; confirmation of the next week's appointment; and reassurance with consolation about the reaction and pain. The interviewer was instructed to be sympathetic, to reassure patients that whatever reaction they were having was within the range of expected normal limits, and to be positive about a successful outcome of the PSP.

When subjects returned for postoperative care 1 week later, after the removal of dressing and sutures, they were asked to complete a form. Included was a 100-mm written and numerical visual analogue scale to allow a subjective qualitative and quantitative intensity assessment of postoperative PSP pain, and a questionnaire that asked whether pain tablets were used, how many tablets were used (number left from 12, used up, or purchased more), type of PSP, and whether they had been called after the procedure. All patients were not in any pain prior to the beginning of surgery. Thus, this management of PSP was standardized within limits, and a postoperative call was the focal variable. Operators were not involved with the completion of the questionnaire.

Type of procedure (Fig 1), age, and gender were retrieved from hospital records, and collective data were grouped according to PC and NC. The possible procedures were: open flap curettage for pocket reduction and root planing; masticatory mucosal free gingival autograft; clinical crown lengthening; mucosal biopsy; hemisection and extraction; or root resection and removal. The collection of data extended over a period of 40 months. Groups were compared by means of the Student's t test and correlations were made by linear regression. A value of $P < 0.05$ was considered significant. Data were presented as means ± the standard error of the means (SEM).

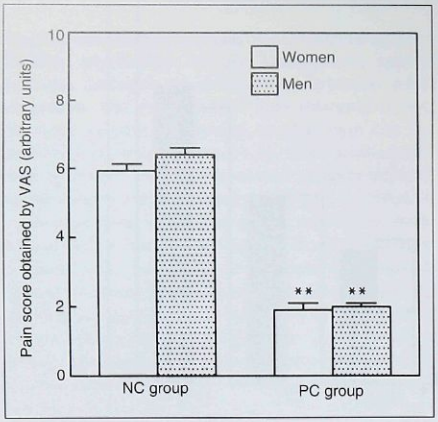

Fig 2a Pain scores of men and women in control (NC) and experimental (PC) groups. $^{**}P < 0.01$ vs NC.

Table 1 Gender Distribution, Age, and Number of Teeth per Procedure in the NC and PC Groups

	NC	PC
No. men (mean age [y] ± SEM)	27 (50 ± 1.7)	27 (51 ± 2.0)
No. women (mean age [y] ± SEM)	32 (49 ± 2.0)	32 (50 ± 2.2)
Mean no. teeth per procedure ± SEM	3.9 ± 0.25	3.9 ± 0.28

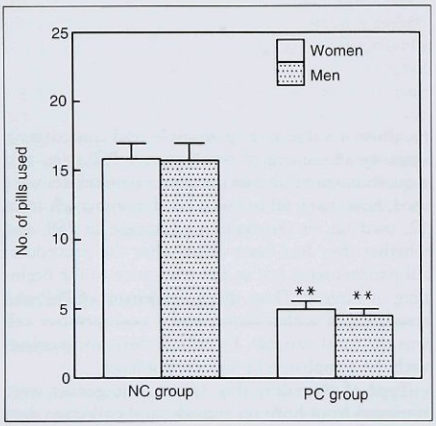

Fig 2b Number of pills used by men and women in control (NC) and experimental (PC) groups. $^{**}P < 0.01$ vs NC.

Results

Groups were age-matched and sex-matched (Table 1). The number of teeth involved per procedure and the types of operations performed in the two groups were not significantly different (Table 1 and Fig 1). The subjective report of pain intensity scores was 6.1 ± 0.15 in the NC group, which was significantly reduced in the PC group (1.96 ± 0.12; $P < 0.001$) (Fig 2a). The number of pills used was significantly higher ($P < 0.001$) in the NC group (15.7 ± 1.2 pills per week) compared to the PC group (4.7 ± 0.55 pills per week) (Fig 2b). There was a significant positive correlation between pain intensity and the number of analgesic tablets consumed in the NC group ($r = 0.41$, $P < 0.01$), PC groups ($r = 0.50$, $P < 0.001$), and the two groups combined ($r = 0.79$, $P < 0.001$) (Figs 3a to 3c).

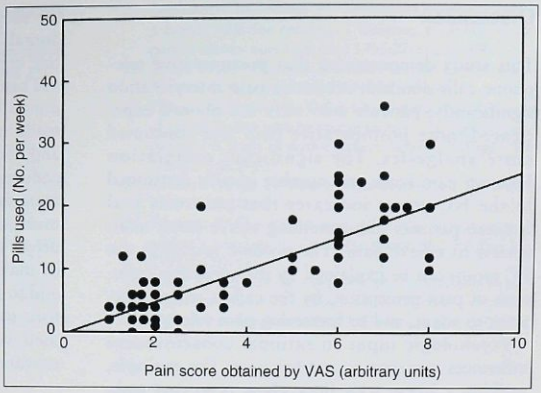

Fig 3a Linear regression between number of pills used and pain scores in the PC group + NC group ($r = 0.79$, $P < 0.001$).

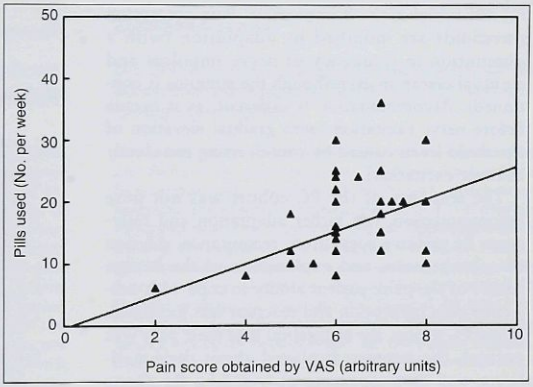

Fig 3b Linear regression between number of pills used and pain scores in the NC group ($r = 0.50$, $P < 0.001$).

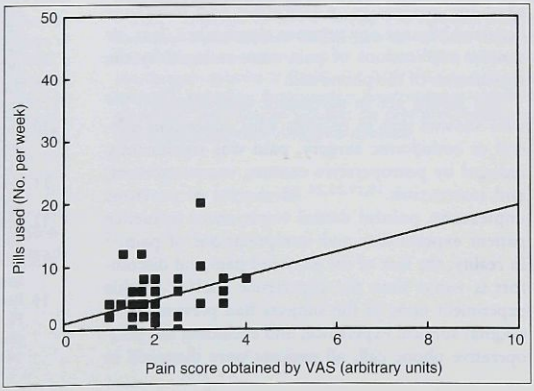

Fig 3c Linear regression between number of pills used and pain scores in the PC group ($r = 0.41$, $P < 0.01$).

Discussion

This study demonstrated that postoperative telephone calls diminish subjective pain interpretation significantly; patients who were not phoned experienced more postoperative pain and consumed more analgesics. The significant correlation between pain score and number of pills consumed in the NC group indicates that pain was real because patients did something active (took analgesics) to relieve pain. The positive results in the PC group can be explained by the conscious influence of pain perception, by the callers' encouragement to adapt, and by increasing pain tolerances.

Psychologic input to rational consciousness influences perceptions and behavior. For example, walking a 30-cm wide floor plank is an easy task, but if the same walk is elevated several meters perceptions are modified so that the perceived stressful difficulties make it impossible. Pain perception thresholds are modified by adaptation (with a diminution in frequency of nerve impulses and eventual cessation even though the stimulus is continued). Accommodation is different, as it occurs before nerve excitation (with gradual elevation of threshold levels caused by stimuli rising too slowly to cause excitation).

The response of the PC cohort was not pure accommodation, but rather adaptation and tolerance. By positive suggestion, reassurance, dilution of apprehension, and explanation of the benign nature of the pain, patient ability to cope with subjective pain perception and reaction was increased. In the PC group, the suggestion that their pain was normal, the interest displayed about their well-being, and the reassurance provided by the phone call helped subjects to maximize their control over postoperative pain interpretation and over their need for analgesics. Adaptation and tolerance occurred because any negative significance, fear, or sinister implications of pain were reduced by the reassurance of the phone call.

Our results are in agreement with others[15,18,23] who showed that in patients who underwent general or endodontic surgery, pain was significantly reduced by postoperative contact, encouragement, and instruction.[18,19,23,24] Memories of previous unpleasant, painful dental experiences influence patient expectations and interpretations of pain.[25] In reality, the fear of the expected pain and discomfort is worse than the experience itself.[26] In this experiment none of the subjects had previous periodontal surgical experience, and excluding the postoperative phone call, all patients were managed in the same manner. Consequently, memory of periodontal surgical pain probably played little, if any, role in the interpretation of pain by the two groups.

This study confirmed that postoperative periodontal surgery-induced pain can be attenuated and made more tolerable through psychologic support and communication with patients after surgical procedures. While this practice is not the norm for many healthcare providers, it would seem prudent to maintain postoperative communication, not only to detect any unforeseen complications early, but also to maximize psychologic support and reassurance, and to help patients cope with postoperative discomfort and pain. A reduction in the number of pills used would also provide financial savings and reduce unwanted side effects derived from analgesics.

Acknowledgments

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Resumen

Estudio de 118 Procedimientos Quirúrgicos Periodontales y la Influencia de las Llamadas Telefónicas Postoperatorias Sobre la Percepción del Dolor

Este estudio examinó la influencia de las llamadas telefónicas postoperatorias en relación a la percepción del dolor y al número de analgésicos consumidos para el alivio del dolor, en dos grupos de pacientes cuyas edades y géneros eran similares. En este estudio participaron 118 pacientes diagnosticados con periodontitis del adulto quienes habían sido sometidos a cirugía periodontal luego del examen y de la terapia curativa consistente en raspado, alisado radicular, y la remoción de irritantes locales. Todos los participantes recibieron un cuidado similar, instrucciones postoperatorias, y medicaciones. La única variación consistió en que un grupo de 59 pacientes fueron llamados por teléfono 24 horas después de la operación (GLl), y el resto (GNoLl), no fueron llamados. Las personas que hicieron las llamadas cubrieron 10 puntos con los pacientes, además tuvieron una actitud tranquillizadora y positiva acerca del resultado de la cirugía. Luego de una semana de la operación, los pacientes completaron un cuestionario para clasificar la intensidad del dolor sobre una escala análoga visual; además indicaron el número de pastillas que habían ingerido, y si habían recibido la llamada postoperatoria. Se observó que el dolor y los analgésicos ingeridos disminuyeron significativamente en el grupo de pacientes que habían sido llamados ($P < 0,001$), en comparación con el otro grupo. También se encontró una correlación positiva significativa entre el dolor y las pastillas consumidas en los grupos combinados ($r = 0,79$, $P < 0,001$ GLl + GNoLl), y en los grupos separadamente ($r = 0,50$, $P < 0,001$ GLl; $r = 0,41$, $P < 0,001$ GNoLl). Se concluye que la comunicación postoperatoria entre los trabajadores de las ciencias de la salud y sus pacientes reduce la percepción del dolor significativamente, y el número de analgésicos utilizados para el alivio del dolor.

Zusammenfassung

Der Einfluss von Postoperativen Telefonanrufen auf die Schmerzwahrnehmung: Eine Studie von 118 Parodontal-Chirurgischen Eingriffen

Diese alters- und geschlechtsentsprechende Studie untersuchte den Einfluss von postoperativen Telefonanrufen auf die Schmerzwahrnehmung und auf die Anzahl verwendeter Analgetika. Erwachsene Parodontitispatienten (n = 118) erhielten Parodontalchirurgie nach Untersuchung und Hygienebehandlung (Scaling, Wurzelglättung und Beseitigung von lokalen Reizen). Alle Personen bekamen ähnliche Behandlung, postoperative Instruktionen und Medikation, aber 59 Personen wurden 24 Stunden postoperativ angerufen (PC Gruppe), 59 nicht (NC Gruppe). Die Angerufenen behandelten 10 Punkte und wurden beruhigt und positiv eingestellt über das chirurgische Ergebnis. Eine Woche postoperativ beantworteten die Testpersonen einen Fragebogen, welcher die Schmerzintensität auf einer visuellen Analogskala taxiert und die Anzahl der Tabletten anzeigt, welche verwendet wurden und wie sie hiessen. Schmerzen und verwendete Analgetika waren in der PC Gruppe signifikant erniedrigt ($P < 0.001$), verglichen mit der NC Gruppe. Eine signifikant positive Korrelation wurde zwischen Schmerz und verwendeten Tabletten in den Gruppen kombiniert ($r = 0.79$, $P < 0.001$ PC + NC) und in den Gruppen getrennt ($r = 0.50$, $P < 0.001$ PC; $r = 0.41$, $P < 0.01$ NC) gefunden. Postoperative Kommunikation zwischen Medizinern und Patienten reduziert die Schmerzwahrnehmung und Anzahl verwendeter Analgetika signifikant.