

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jpor

Original article

A risk factor analysis of accumulated postoperative pain and swelling sensation after dental implant surgery using a cellular phone-based real-time assessment



Ryuta Kuroi DDS, PhD^a, Hajime Minakuchi DDS, PhD^{a,*},
 Emilio Satoshi Hara DDS^a, Aya Kawakami DDS, PhD^a,
 Kenji Maekawa DDS, PhD^a, Hiroki Okada MD, PhD^b,
 Takuo Kuboki DDS, PhD^a

^a Department of Oral Rehabilitation and Regenerative Medicine, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Japan

^b Medical Education Center, Kagawa University Faculty of Medicine, Japan

ARTICLE INFO

Article history:

Received 22 August 2014

Received in revised form

3 May 2015

Accepted 12 May 2015

Available online 12 June 2015

Keywords:

Postoperative pain and swelling sensation

Dental implant

Risk factor

Ecological momentary assessment

Prospective cohort study

ABSTRACT

Purpose: The purpose of this study was to identify the related risk factors of dental implant accumulated postoperative pain and swelling by cellular phone-based assessment.

Methods: Subjects were a consecutive series of patients who received oral implant surgery at Okayama University Hospital. Cellular phone-based questionnaire was sent at pre-set schedule to each subject every 2 h on the day of surgery, and every 24 h from the 2nd to 7th day post-surgery. Subjects replied in real-time the pain and swelling levels at the operated sites by an 11- and 4-grade rating-scale questionnaire. Overall intensity of individual pain and swelling was calculated by means of area under curve that drew by their time-dependent changes. Predictor variables were age, gender, presence of diabetes mellitus and/or hypertension (DM/HT), history of implant surgery, number of inserted implants, flap operation, surgical duration, pre-surgery anxiety, osteoplasty, bone quality, premedication, dosage of prescribed analgesics and local anesthesia and accumulated postoperative pain/swelling. Compliance rate and risk factors correlated with accumulated postoperative pain and swelling were calculated by multiple regression analysis.

Results: Final subjects were 18 females and 7 male (mean age: 59.3 ± 7.32 yrs). Significant factors correlated with accumulated postoperative pain were DM/HT, surgical duration, premedication, bone quality, pre-surgery anxiety and postoperative swelling ($R^2 = 0.769$, $p = 0.001$, 0.013 , 0.032 , 0.007 , 0.035 and 0.007 , respectively). Meanwhile, significant factors associated with postoperative swelling were postoperative pain, DM/HT and bone quality ($R^2 = 0.365$, $p = 0.002$, 0.004 , 0.008 , respectively).

* Corresponding author at: Department of Oral Rehabilitation and Regenerative Medicine, Okayama University Graduate School Medicine, Dentistry and Pharmaceutical Sciences, 2-5-1 Shikata-cho, Kita-ku, Okayama 700-8525, Japan. Tel.: +81 86 235 6682; fax: +81 86 235 6612.

E-mail address: hajime@md.okayama-u.ac.jp (H. Minakuchi).

<http://dx.doi.org/10.1016/j.jpor.2015.05.003>

1883-1958/© 2015 Japan Prosthodontic Society. Published by Elsevier Ireland. All rights reserved.

Conclusion: These results suggested DM/HT and bone quality are correlated to overall intensity of postoperative pain and swelling.

© 2015 Japan Prosthodontic Society. Published by Elsevier Ireland. All rights reserved.

1. Introduction

Oral implant therapy has been widely recognized as a reliable and efficient dental treatment with high predictability [1]. However, since implant insertion involves a surgical procedure, symptoms such as pain, swelling and/or discomfort at the operated site are inherent to the treatment, and thus some patients may refuse to be submitted to this treatment modality. Although various methods and management approaches have been developed in attempt to reduce such symptoms, efficacies of those managements had been evaluated mainly by paper-based questionnaires either by periodical clinical assessments or by means of daily symptom diary. However, several researches have raised problems on the validity of such measurement methods [2,3]. For instance, despite of its simplicity and wide utilization, paper-based questionnaire can be subjected to bias due to physician-patient relationship and memory distortion, which eventually reduce the reliability of the measurement [4].

Recently, an Ecological Momentary Assessment (EMA) concept has been developed and utilized in the psychiatric field. The EMA is a method that enables real-time assessment and record of subjects' symptoms related to either physical and/or mental condition, and to avoid recall bias [5]. Moreover, EMA also enables data collection at each person's natural environment. Thus, it can reduce bias caused by ambiguous memory, and consequently, it increases the validity level of the assessment [6].

Recently, David et al. [7], noticed the high accessibility of the general population to cellular phone, and developed a novel cellular-phone combined real-time assessment system. This system enables not only real-time measurement of physical/mental conditions, but also an easy handling of the time-scheduled questionnaires by the patients with a consequent decrease in missing or incomplete data, and an easy record of all information in a computer (PC) server [7]. Based on the advantages of this c-EMA system, we attempted to apply it for measurement of the fluctuation of oral implant postoperative pain and swelling. Thus, the purpose of this study was to identify significant aggravating factors that would correlate with the accumulated postoperative pain and swelling after dental implant surgery calculated sequentially from the starting point (immediately after surgery) up to the 7th day post-surgery. The established null hypothesis was that no significant factor could be detected by the multiple regression analysis.

2. Subjects and methods

2.1. Subjects

The recruited subjects were a consecutive series of patients who received oral implant surgery at the Fixed Prosthodontic

Clinic in Okayama University Hospital from 1st of July to 15th of September in 2010. Exclusion criteria were those: (1) not having a cellular phone, (2) unable to browse the web in a cellular phone, (3) unable to operate the mail function of a cellular phone, (4) who had taken antidepressants, antipsychotic drugs, mood stabilizers, anxiolytics, sedatives or sleeping medications within the last 6 months prior to the study onset. This experimental protocol was approved by the Ethical committee of Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences (#224) before starting subjects recruitment and data collections.

2.2. Cellular phone-based EMA system

The cellular phone-based EMA (c-EMA) system used in this study was regulated by a host PC server that automatically sends e-mails at a pre-set schedule to individual's cellular phone. The registered subjects received an e-mail displaying the URL of the executive PC server, and they could then have access to the questionnaire. This questionnaire was consisted of drop-down rating scales (DRS), and the answers were stored in the PC server database immediately after the subjects returned the fulfilled questionnaire. Subjects' demographic data were also stored in the PC server on an anonymous basis.

2.3. Methods

All subjects were explained the study protocol and the usage of the c-EMA system individually by one research coordinator (R.K). They were sent the questionnaire regarding their current pain and self-estimated swelling levels at operated sites from the system PC server automatically to individual cellular phone every 2 h on the day of surgery, and then every 24 h onward the following day until the 7th day after surgery. The degree of momentary pain and swelling were measured by an 11-grade and 4-grade rating-scale questionnaires, respectively. The anchor words for pain levels were "painless", which corresponded to level "0", and "intolerable pain" corresponding to maximum pain level "10". Regarding the subjective swelling sensation, "no swelling" was considered as level "0", "swelling of a limited area" as "1", "swelling of an extended area" as "2" and "swelling extended to extra-oral region" as "3". If answer was not obtained at every time point, the mean score calculated using the previous and immediately after the blank point was regarded as an alternative score to the blank point. Since the previous report indicated that shorter time-intervals increase the burden to patients, and consequently induce a decrease in response rates [8], this study adopted the protocol to send the questionnaire at 2-h interval.

The outcome variables were the accumulated postoperative pain and subjective swelling sensation at operated sites. They were calculated by means of the area under the curve (AUC) that drew by the time-dependent change of pain and

Download English Version:

<https://daneshyari.com/en/article/3160657>

Download Persian Version:

<https://daneshyari.com/article/3160657>

[Daneshyari.com](https://daneshyari.com)