قالوا سبحانك لا علم

لنا إلا ما علمتنا إنك

أنت العليم الحكيم

صدق الله العظيم

سورة البقرة الآية (٣٢)

EFFECT OF LOW INTENSITY LASER AND MICONAZOLE GEL ON ORAL MUCOSITIS IN NECK CANCER PATIENTS RECEIVING RADIOTHERAPY

By

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B.SC. "PHYSICAL THERAPY"

تأثير الليزر منخفض الشدة وجل الميكونازول على إلتهاب الغشاء المخاطى للفم فى مرضى سرطان الرقبة المتلقون للعلاج الاشعاعى

مقدمة من

أحمد جهاد العسال

بكالوريوس العلاج طبيعي


Introduction

Oral mucositis (OM) is still a common and severe acute side-effect of many oncologic treatments, especially in patients treated for head and neck cancer. It may affect quality of life; require supportive care and impact treatment planning and its efficacy. Significant advancements have been made in the management of patients undergoing cancer chemotherapy and radiotherapy. However, many debilitating side effects such as vomiting, nausea, diarrhea, and mucositis remain critical issues that often delay or truncate therapy and impede recovery. Mucositis is a painful condition that significantly impairs chewing and swallowing. Previously referred to as "stomatitis" or "mouth sores," mucositis presents as redness and/or ulcerative sores in the soft tissues of the mouth. Mucositis is seen in patients with reduced white blood cell counts due to cancer chemotherapy and/or therapeutic irradiation

- **Oral mucositis is an important clinical problem because of the pain, the requirement for parenteral nutrition and the risk of mucosal infection and subsequent septicaemia. In many patients undergoing myeloablative therapy, it is the recovery of the oral mucosa, rather than haematological function, that delays the patient's discharge. New treatments are needed to reduce the duration and severity of mucositis, but these can only be developed once the natural history of mucositis has been described. Here, we report the clinical progress and multivariate analysis of the causes of oral mucositis in patients undergoing myeloablative therapy in a dedicated bone marrow transplantation unit**

Low-level laser therapy (LLLT) seems to promote pain relief and reduces OM incidence and its severity. It has been recommended for these patients as a treatment option but without any consensus in the LLLT procedure. Also oral mucositis is a common complication of bone marrow transplantation (BMT) conditioning therapy. Sequelae consist of increased risk for infection, moderate to severe pain, compromised oral function, and bleeding

- The salutary effect of laser therapy in medical practice connects with the improvement of microcirculation and the activation of cell proliferation. The concepts of free radical mechanism of low level laser irradiation (LLLI) stimulating action to the endogenous porphyrins, which are chromophores of LLLI in the red spectral range and known as photo sensitizers, localized in blood cells membrane and absorb photons of the LLLI. This process is the basis for initiation of photosensitized free radical reaction including lipid peroxidation of blood leukocyte membranes with subsequent formation of lipid hydroperoxides. Peroxidative modification of membrane lipids increases cell membrane ionic permeability for calcium ions

Purpose of the study

Purposes of this study were the following:

To determine the therapeutic efficacy of the LILT in improving oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.

2-To evaluate the efficacy of miconazole gel in improving oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.

3- To evaluate the efficacy of both LILT and miconazole gel in improving oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.

3- To gain knowledge about the LILT and miconazole gel application and implementation in oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.

5- To share in designing an ideal protocol for the treatment of the oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.

MATRIALS AND METHODS

Subjects

This study was carried out on 45 patients (30 males and 15 females) who had oral mucositis, ulceration and pain in neck cancer patients receiving radiotherapy, their ages were ranged from 30 to 55 years, they were free from any immuno-deficiency disorders or disease that can affect healing process and influence the results and they were selected randomly from patients of the National cancer Institute, Cairo university.

Patients groups.

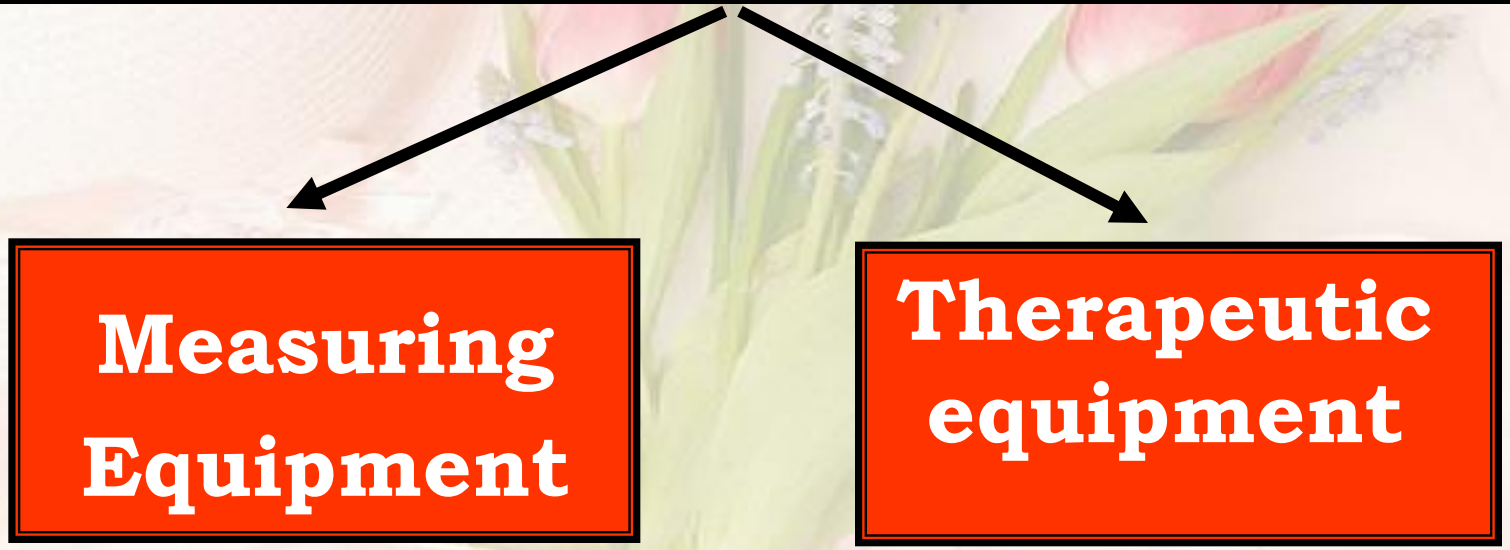
Group A: (LILT group): **This group was composed of 15 patients who received the LILT in addition to the medical care of oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.**

Group B:(Miconazole gel group): **This group was composed of 15 patients who received the miconazole gel in addition to the medical care of oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.**

Group C :(Both LILT and miconazole gel group): **This group was composed of 15 patients who received the LILT and miconazole gel in addition to the same previously mentioned medical care of oral mucositis ulceration and pain in neck cancer patients receiving radiotherapy.**

Equipment Used

Equipment Used



WHO oral mucositis scale (OMS)

Grades	Description
0	None
1	Mild grade means soreness+/- erythema with no ulceration
2	Moderate grade means erythema and ulcers but patient can swallow solid diet.
3	Severe grade means ulcers and extensive erythema but patient cannot swallow solid diet only liquid diet is possible
4	Life-threatening grade means mucositis to the extent that alimentation is not possible

Common toxicity criteria scale (CTCS)

Grades	Description
0	None
1	Mild grade means painless ulcers, erythema or mild soreness in the absence of lesions
2	Moderate grade means painful erythema or ulcers but eating or swallowing possible
3	Severe grade means painful erythema, oedema or ulcers requiring intravenous hydration**.**
4	Life-threatening grade means severe ulcerations or requiring parenteral or enteral nutritional support or prophylactic intubation
5	Means death related to the toxicity

Therapeutic equipment

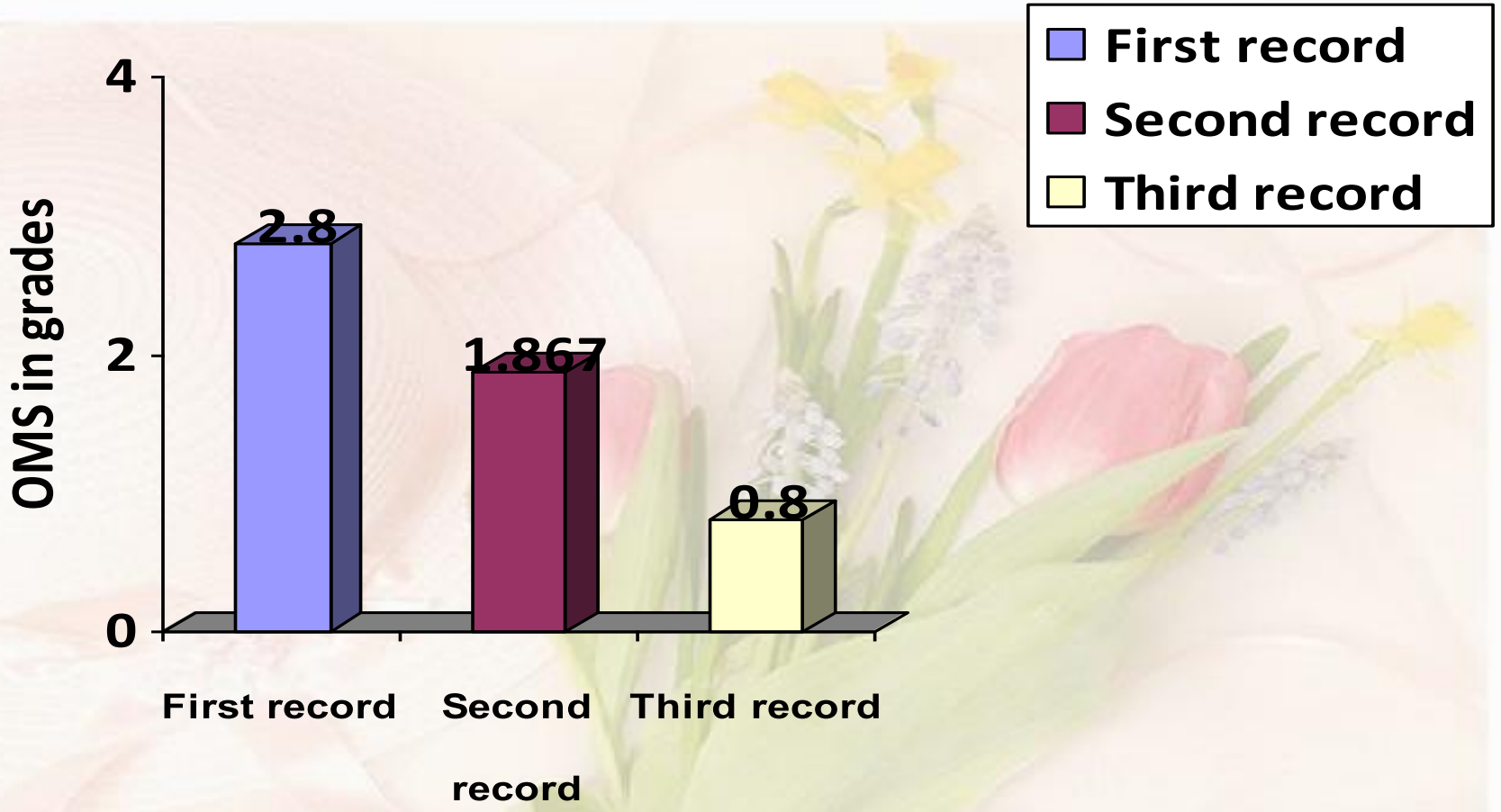
Laser apparatus

. **Miconazole gel 2.5 % (40 gram). .**

Treatment procedures

Procedures of laser application..

Results



Bars representing the mean values of the OMS in grades of the 3 records in the first experimental group (LILT).

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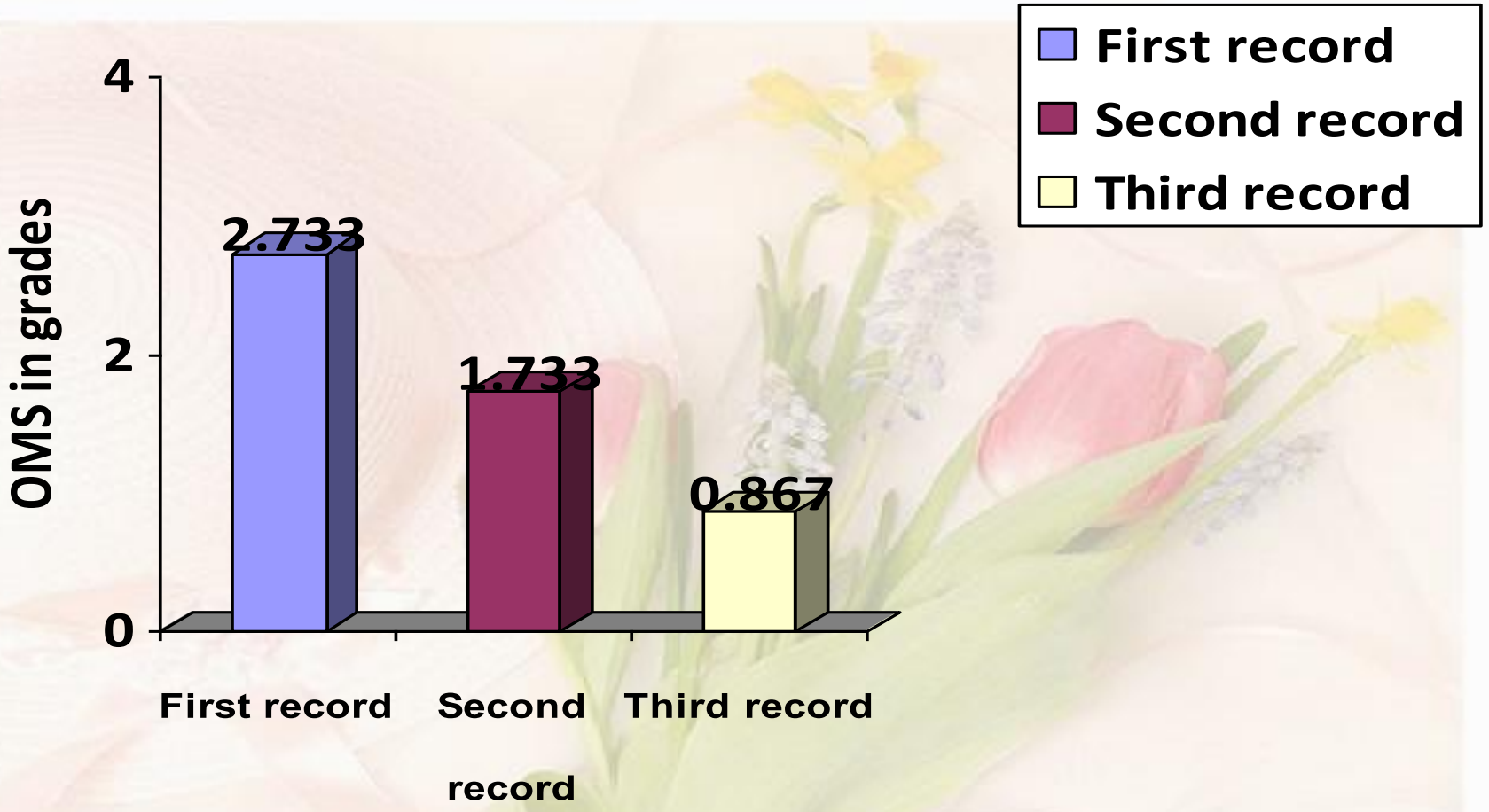
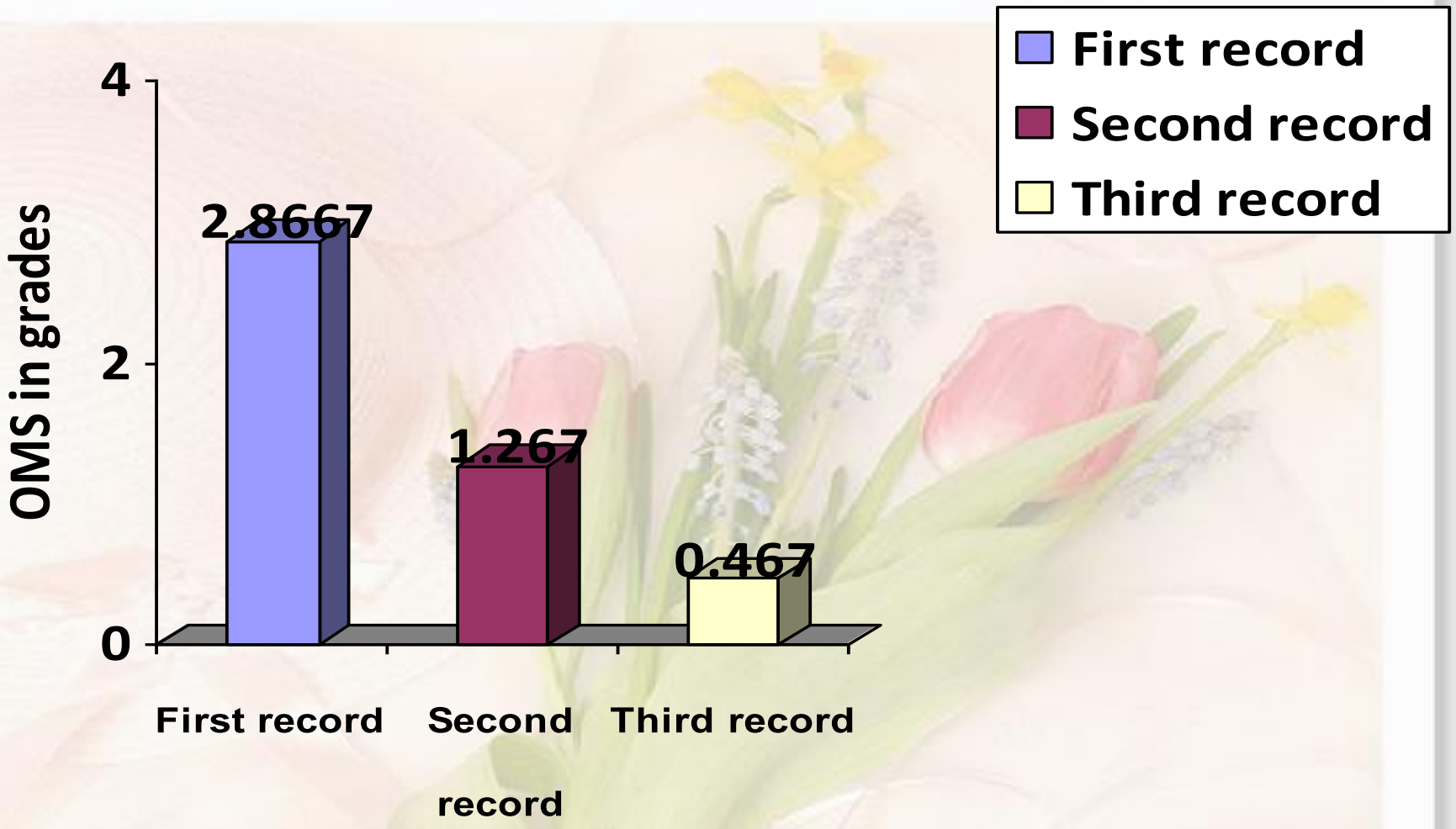
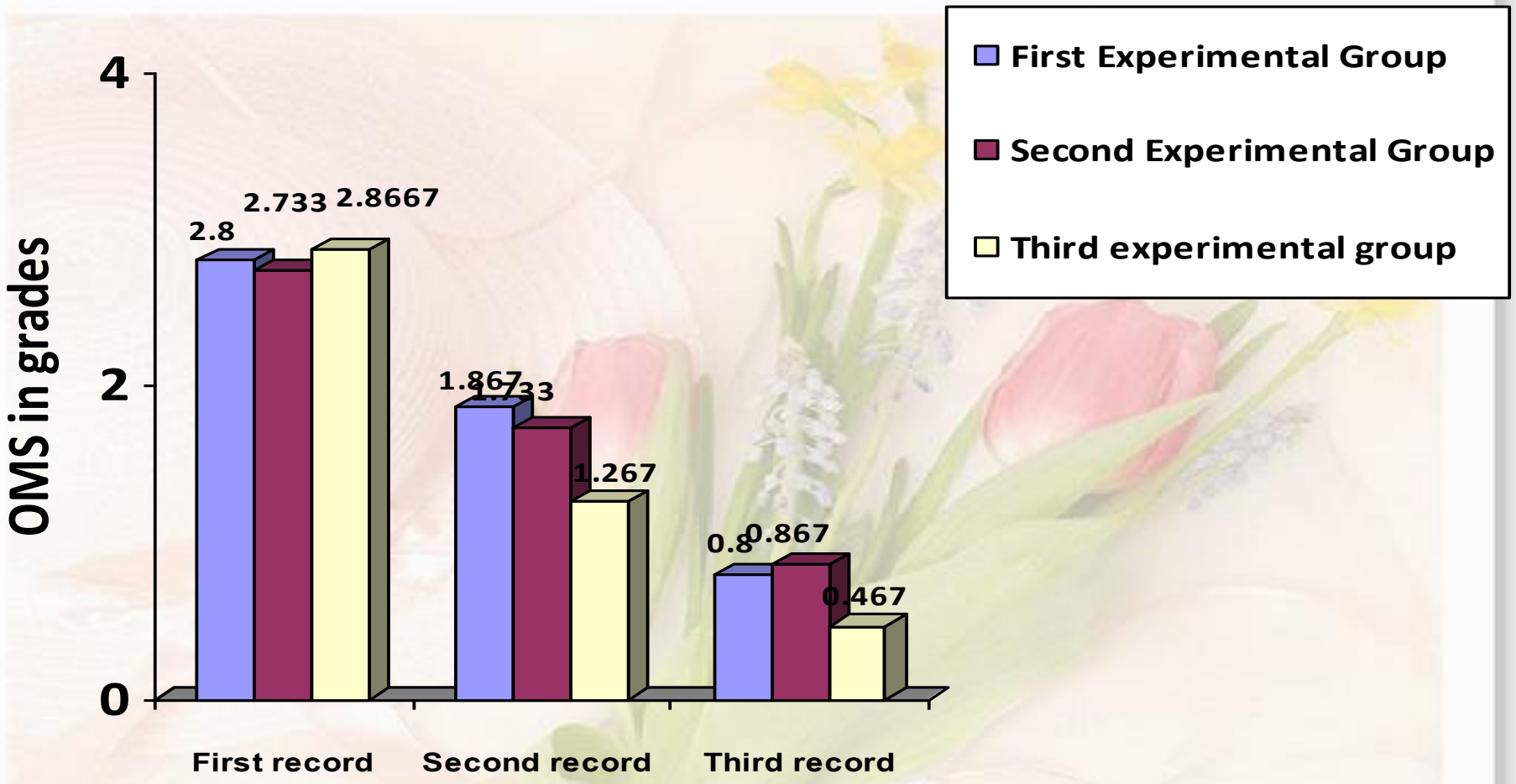


Bars representing the mean values of the OMS in grades of the 3 records in the second experimental group B (Miconazole gel group).

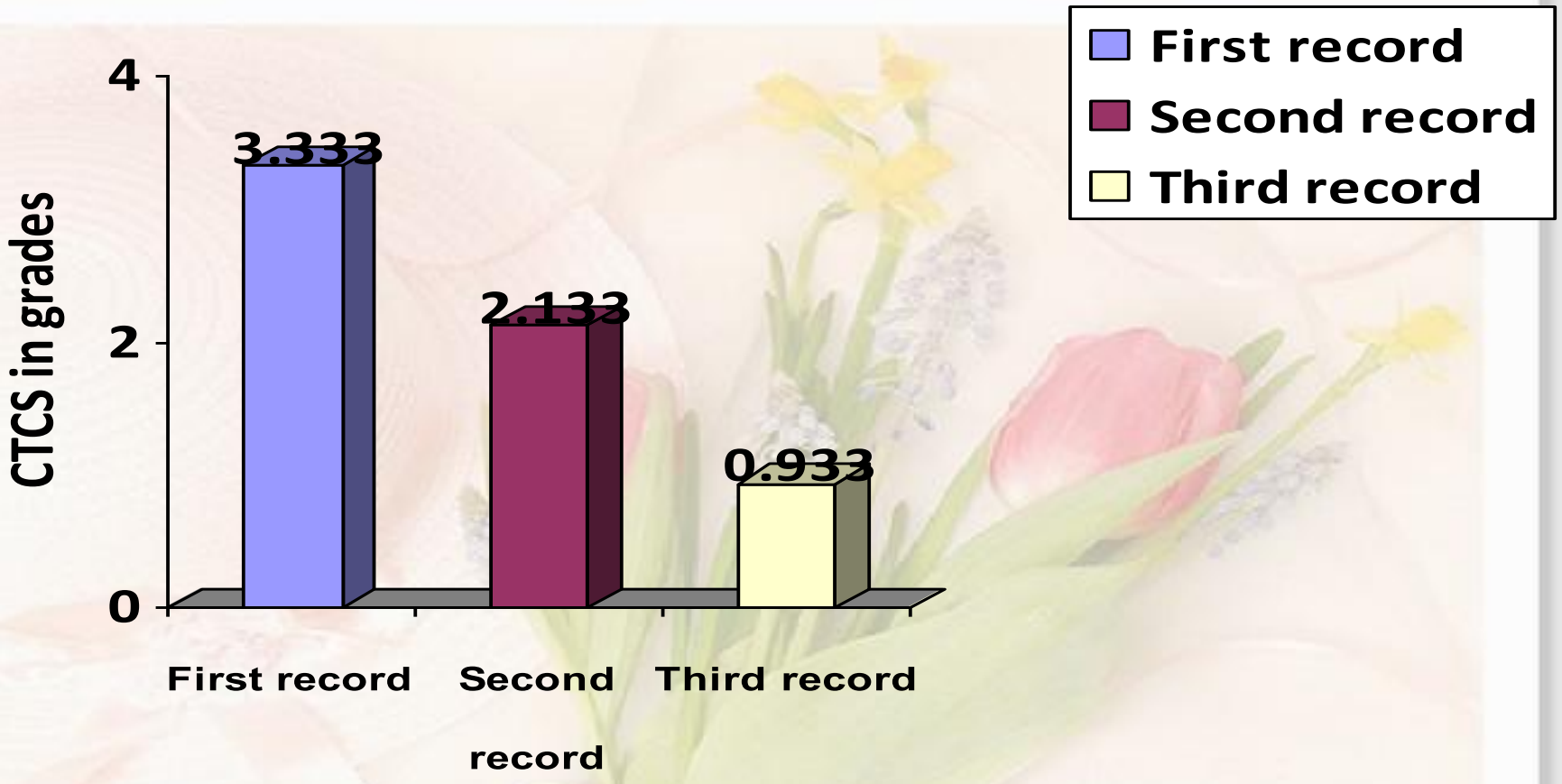


Bars representing the mean values of the OMS in grades of the 3 records in the third experimental group C (Both LILT and miconazole gel group).



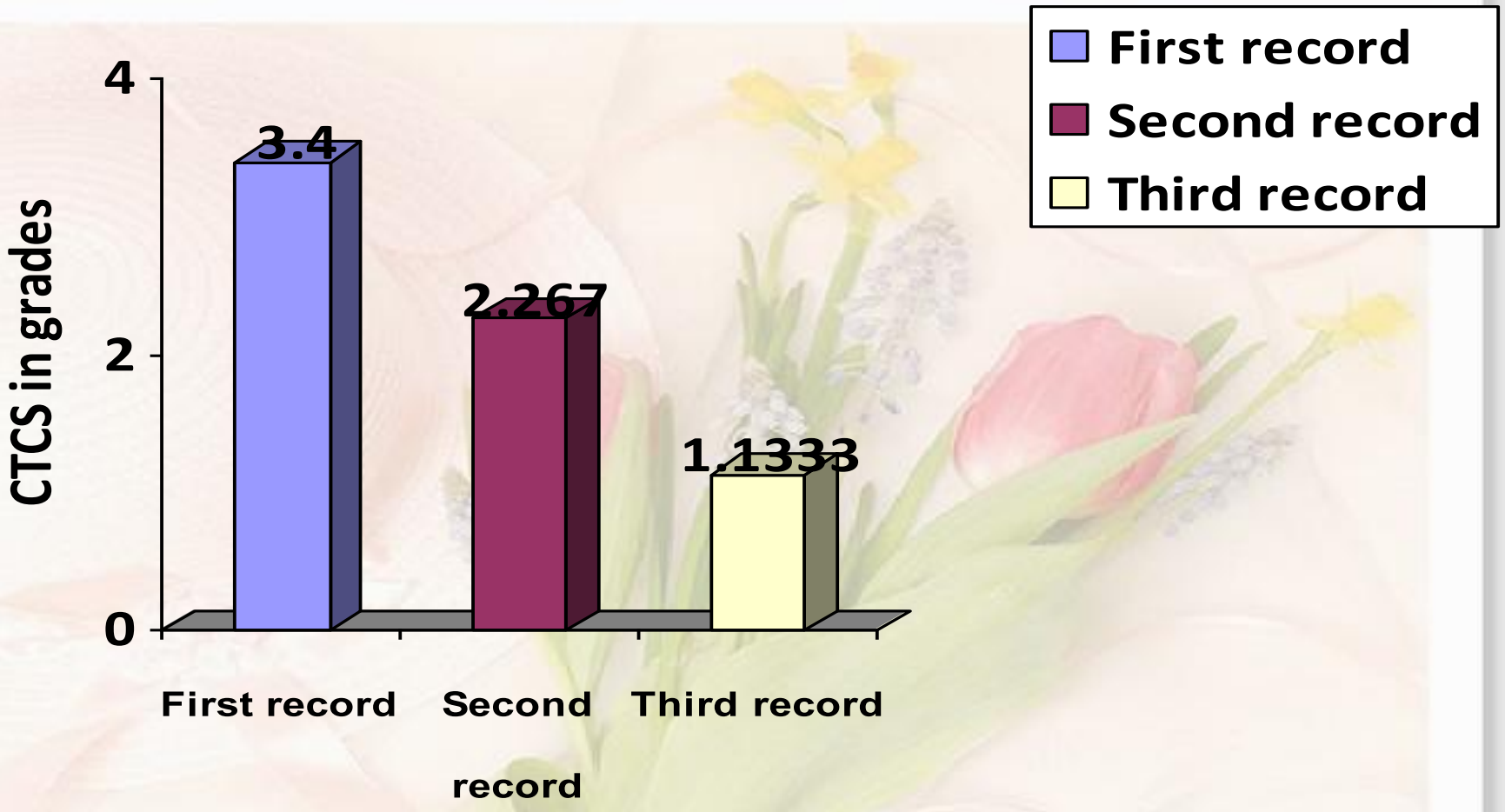
Periods of evaluation.

Bars representing the mean values of OMS in grades of the 3 records of the three experimental groups.



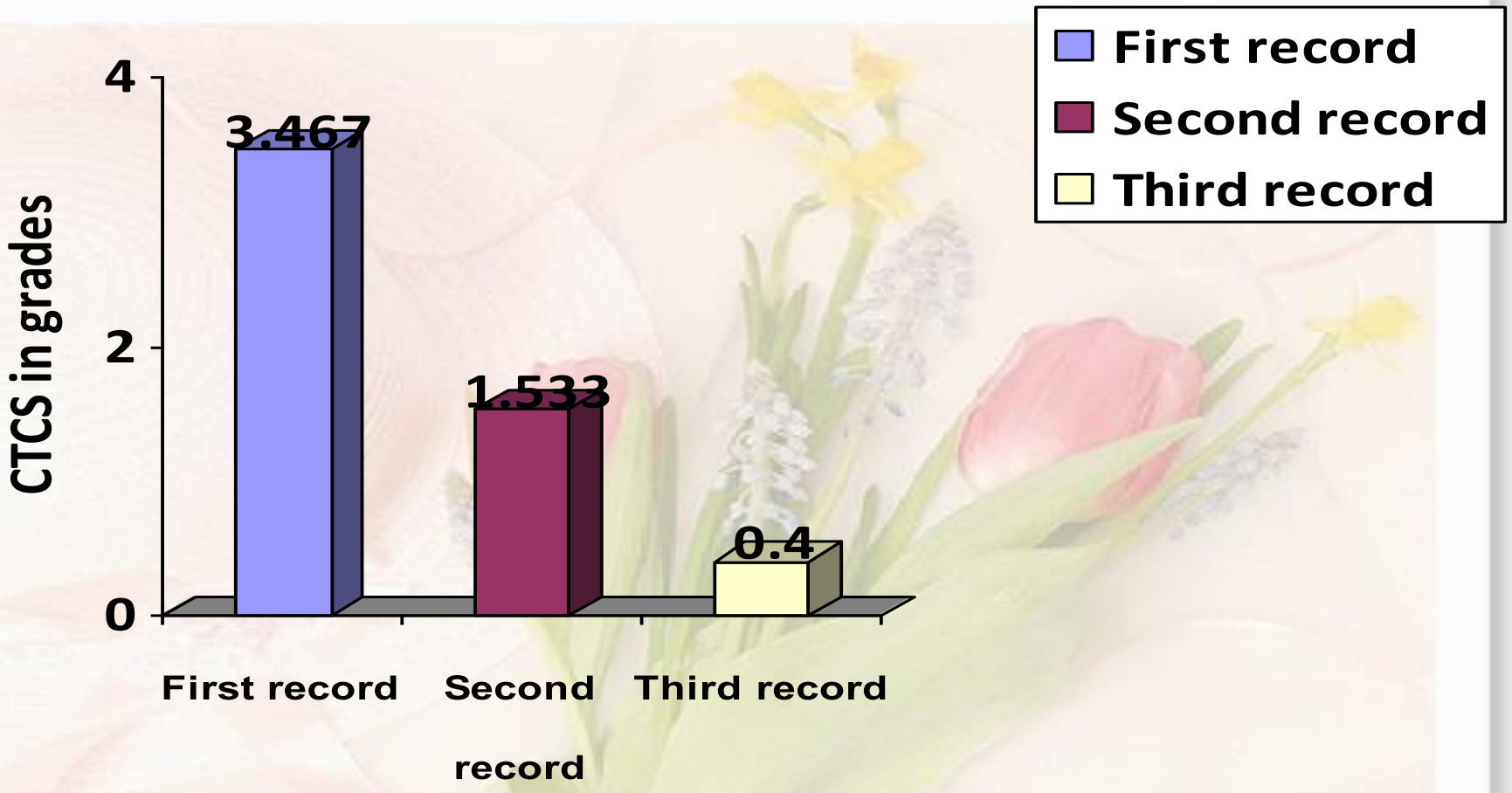
Periods of Evaluation.

Bars representing the mean values of the CTCS in grades of the 3 records in the first experimental group (LILT).

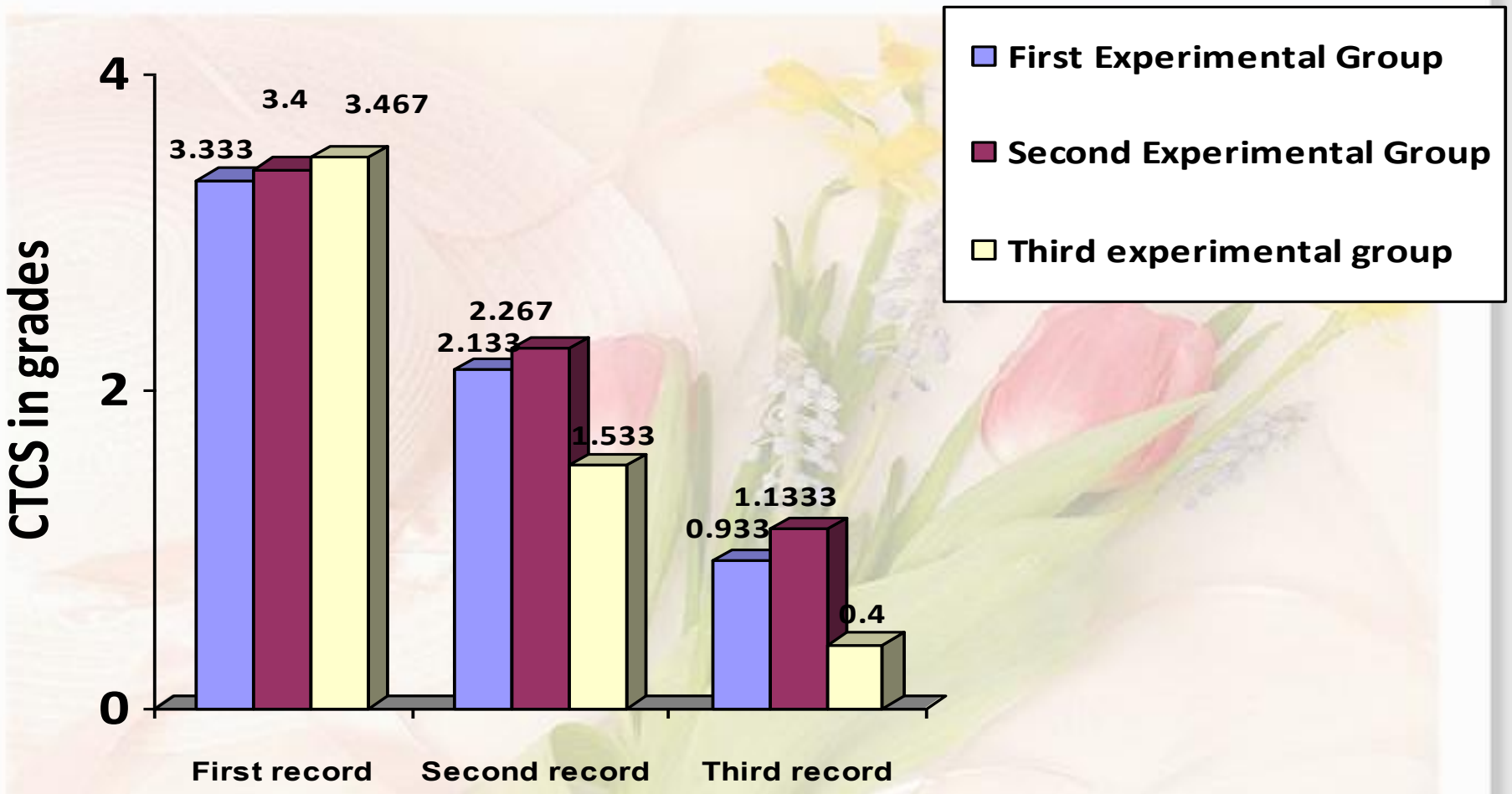


Periods of evaluation.

Bars representing the mean values of the CTCS in grades of the 3 records in the second experimental group B (Miconazole gel group).



Bars representing the mean values of the CTCS in grades of the 3 records in the third experimental group C (Both LILT and miconazole gel group).



Periods of evaluation.

Bars representing the mean values of the CTCS in grades of the 3 records of the three experimental groups.


DISCUSSION

Significant differences, between the second experimental group (Miconazole gel group) and the first experimental group (LILT group), between the third experimental group (Both LILT and miconazole gel group) and the first experimental group (LILT group), as well as between the third experimental group (Both LILT and miconazole gel group) and the second experimental group (Miconazole gel group), which were in the form of a highly significant decrease in the OMS and CTCS, were consistent with those observed and recorded by Antonio et al., 2007; Bolton et al., 2008; Carnel et al., 2010; Damante et al., 2004; Demir et al., 2004; Epstein et al., 2007; Franek et al., 2002; Garfunkel et al., 2011; Georges et al., 2005; Greco et al., 2001; Kreisler et al., 2006; Lagan et al., 2002; Lichtenstein and Morag, 2007; Lucas et al., 2003 and Zerbe et al., 2012.

Eventually, after the discussion of the results and according to reports of the previous investigators in fields related to this study, it can be claimed that the application of low intensity laser and miconazole gel on oral mucositis in neck cancer patients receiving radiotherapy had a valuable healing effects. The results of this study supports the expectation that both the low intensity laser and miconazole gel were effective and nearly equivalent in enhancing healing of oral mucositis in neck cancer patients receiving radiotherapy, but the cumulative effect of their combination was more fruitful than the application of any one of them alone as manifested by the highly decreases of OMS and CTCS.


Summary
&
Conclusion

The results of this study supports the expectation that both the low intensity laser and miconazole gel were effective and nearly equivalent in enhancing healing of oral mucositis in neck cancer patients receiving radiotherapy, but the cumulative effect of their combination was more fruitful than the application of any one of them alone as manifested by the highly decreases of OMS and CTCS.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