Title:
Evaluation of the Therapeutic Effect of Calendula Officinalis Gel on Oral Mucositis Induced by Chemotherapy in Hamster

First Advisor:
Dr. Dariush Amanat
D.M.D, M.Sc.D

Second Advisor:
Dr. Nader Tanideh
Assistance Professor of Pharmacology Department

Consultants:
Dr. Azadeh Andishehtadbir
Dr. Soleyman Mohammadi Samani

By:
Parisa Tavakoli

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Abstract:

Oral mucositis is a painful and debilitating condition that occurs as a side effect of cancer treatment particularly during chemotherapy. As a major event in overlapping multiphase process, it occurs initially via production of free radicals, liberation of which is subsequently followed by activation of inflammatory pathways.

Calendula, also known as marigold is a self-seeding annual plant that thrive in any soil. Calendula officinalis has been shown through pharmacological investigations to possess activities including anti-inflammatory, antioxidant, antimicrobial and wound healing.

Knowing the pharmacological effects of calendula officinalis, our research was designed to evaluate the clinical and histological outcomes of oral mucositis treated by calendula officinalis gel.

Purpose: The purpose of this study is to evaluate the therapeutic effect of calendula officinalis gel on oral mucositis induced by chemotherapy in hamster.

Material and method: In this trial 57 male adult Golden Syrian hamsters were used and randomly divided into 3 groups: the control group received chemotherapy with no medication. The second group was further divided into 2 subgroups. Subgroup A received chemotherapy and treated with 5% calendula officinalis gel and subgroup B received chemotherapy and treated with 10% calendula officinalis gel and the third group received chemotherapy and gel base (with no calendula officinalis) on oral mucositis.

Chemotherapy was administered by intra peritoneal injection of 5_FU on days 0, 5 and 10 of the experiment. On days 1, 2 and 10 of the experiment the cheek pouches were averted and irritated by superficial scratching with 18 gauge sterile needle. Medication was administered topically from day 12 to day 17 once daily using a swab.

On days 13, 15 and 17 of the experiment cheek pouched were examined visually for macroscopic scoring and excisional biopsies were obtained for
microscopic scoring. The data were statistically analyzed by analysis of variances and kruskal-wallis test.

**Results:** In the groups received both chemotherapy and calendula officinalis treatment, healing of oral mucositis was significantly improved both clinically and histopathologically (P-value<0.05) in comparison to the other two groups. The group received 5% calendula officinalis gel demonstrated better results in comparison to the group treated with 10% calendula officinalis gel.

**Conclusion:** It seems that calendula officinalis gel (5%) has therapeutic effect on improved healing and shortening the duration of painful and debilitating oral mucositis.

**Key words:** oral mucositis, calendula officinalis medication, chemotherapy.
چکیده فارسی:

مقدمه: مکروزیت دهانی حالتی دردناک و ناتوان کننده است که به عنوان یکی از عواقب درمان سرطان به خصوص شیمی درمانی شناخته شده که به علت تولید رادیکال های آزاد و متعاقب آن فعالیت ژن مسر یا التهابی رخ می‌دهد.

گل همیشه بهار یک گیاه خودرو بوده که همه ساله در خاک یک گوناگون رشد می‌کند. تحقیقات داروسازی انجام شده نشان دهنده ی فعالیت های انتی اسیدانی، ضدالتهابی، ضد میکروبی، ترمیم زخم و غیره این گیاه بوده است.

با عنايت به این مسئله پژوهش حاضر با هدف ارزیابی پاسخ بالینی و میکروسکوپی موکوزیت دهانی با فرض مداخله در پاتوزن و مهار فاکتورهای ذکر شده توسط این گیاه دارویی طراحی گردید.

هدف: هدف از انجام این پژوهش ارزیابی اثر دارویی گل همیشه بهار بر روی موکوزیت دهانی ناشی از شیمی درمانی (FU-5) در مرحله حیوانات می‌باشد.

مواد و روش ها: در این پژوهش از 57 هامستر بالغ استفاده شد که به 3 گروه تقسیم گردیدند. در گروه 1 اول 12 حیوان تحت شیمی درمانی قرار گرفتند اما هیچ درمانی دریافت نکردند. در گروه دوم حیوانات به 2 زیر گروه تقسیم شده که در زیر گروه اول 15 حیوان پس از شیمی درمانی تحت درمان توسط زل 5% و در زیر گروه دوم 15 حیوان پس از درمان شیمی درمانی تحت درمان توسط بیس زل قرار گرفتند. شیمی درمانی در روزهای 0، 5 و 10 انجام شد و در روزهای 17 و 30 مطالعه جهت سهولت و هماسان سازی شرایط ایجاد موکوزیت خراش عرضی در دو سمت مخاط باکال حیوانات ایجاد شد. درمان در گروه های دوم و سوم از روز دوازدهم تا روز هفتم مطالعه همه روشهای یک مرتبه به صورت موضعی بر روی موکوزیت دهانی انجام گردید.

در روزهای 13، 15 و 17 مطالعه بررسی بالینی و هیستوپاتولوژی گونه حیوانات انجام گرفت. برای بررسی داده‌ها از آزمون آنالیز واریانس و کروکاسال و لیس استفاده گردید.

پایش ها: در گروه های درمان شده توسط گل همیشه بهار ترمیم موکوزیت دهانی به صورت قابل ملاحظه ای در مدت زمان انجام آزمایش چه از نظر بالینی و چه از نظر میکروسکوپی (p.value<0.05) تسریح می‌گردد. گروه دریافت کننده زل 5% گل همیشه بهار نتایج بهتری را در مقایسه با زل 10% گل همیشه بهار از خود نشان داد.

نتیجه‌گیری: به نظر میرسد که زل گل همیشه بهار اثر درمانی مناسبی بر روی ترمیم و کوتاه‌تر کردن دوره درمان موکوزیت دهانی دارد.

کلمات کلیدی: موکوزیت دهانی-درمان توسط گل همیشه بهار-شیمی درمانی با FU-5
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