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EFFECTS ON DIABETIC INDUCED WOUND HEALING ACTIVITY SELECTED ON ESSENTIAL OINTMENT TREATMENTIN ALBINO WISTAR RATS

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ABSTRACT

Common complication of diabetic in improved wound systematic medicinal plants Syzygium aromaticum, Rosadamasciena, Lavandular officinalis and triple combined SRL ointment use essential oil improves healing in diabetics which is dose dependent and may have but not side effects. There is a very more information regarding topical Syzygium aromaticum, Rosadamascena Lavandular officinalis and triple combined SRL ointment use. The objective of this study was to evaluate the effect of topical syzygium aromaticum, Rosadamascena and Lavandular officinalis, triple combined SRL ointment use wound healing activity. Diabetes was induced in wistar rats by using Streptozotocin. This control group comprised age- matched animals not submitted to streptozotocin injection. Diabetic statewas confirmed by glycosuria and hyperglycemia. Under diethalin ether anesthesia diabetes infected wound treatment with topical syzygium aromaticum, Rosadamascena Lavandular officinalis and triple combined SRL ointment wound contraction studies effectives wound healing activity compared to studies diabetic infected wound insulin therapy control with treatment in Syzygium aromaticum, Rosadamascena Lavandular officinalis and triple combined SRL ointment apply very more highly effective wound healing activity compared to diabetic wound control, non diabetic wound control and diabetic infected insulin therapy wound

control, it is highly effective wound healing activity and insulin therapy treatment with wound healing activity SRL triple combined ointment used for very more effective medicinal plants diabetic wound healing activity. it is complementary study that is also apply to humans.

KEYWORDS: Streptozotocin, syzygium aromaticum ointment, Rosadamascena ointment, Lavandular officinalis ointment and triple combined SRL ointment.

INTRODUCTION

Diabetes Mellitus is a syndrome more than a disease and affects about 150 million people worldwide.[13] Studies have shown delayed wound healing in diabetics due to cell proliferation deficiency, infection, decreased cell surviving, and reduced wound contraction.[8] Streptozotocin (intraperitoneal) and injection of streptozotocin monohydrate produces insulin decreasing and hyperglycemia in a three days.[1,5] It is a naturally cytotoxic chemical that is particularly toxic to the pancreatic and insulin. Streptozotocin injection leads to the desgeneration of the langerhans islets beta cells. Essential oils and various extracts of plants have provoked interest as sources of natural products. They have been screened for their potential uses as alternative remedies for the treatment of many infectious diseases.[19] It is Particularly, the antimicrobial and antivirus activities of plant oils and extracts have formed the basis of applications, including raw and processed food preservation, pharmaceuticals, alternative medicine and natural therapies.[10]

The present study aims to the initial phases of wound healing in the skin of normal wound healing control and diabetic induced infected wound healing control and diabetic induced infected wound and diabetes induced infected wound treatment with essential ointment to compare wound healing areas in diabetics and their different essential ointment controls after topical Syzygium aromaticum, Rosadamascena Lavandular officinalis and triple combined SRL ointment.

MATERIALS AND METHODS

Toxicity evaluation (LD^{50})

The LD50 for The Wistar rats were procured and acclimatized to laboratory condition. They were maintained on commercial diet supplied by “Hindustan Lever Limited” Bombay, marketed under the trade name “Gold Mohur Feeds” water provided ad libitum. Sixthy six (66) adult healthy male wistar rats with body mass of approximately 200–225 g were used.

Streptozotocin-induced (intraperitoneal) and injection (60 mg/kg,) dissolved in 0.01 M citrate buffer, pH 4.5, immediately before use. Three days later blood glucose levels were determined in diabetic animals were further divided into 11 groups of 6 rats each group. The rats were divided into 11 groups.

Experimental Design

Male Albino Wistar Rats were divided into nine groups (I - IX) each comprising of six male rats weighing in the range of 150-200g were selected.

Group I: Negative wound control in rats.

Group II: Streptozotocin induced infected wound control in rats.

Group III: Streptozotocin induced infected wound insulin therapy treatment control in rats.

Group IV: Streptozotocin induced infected wound insulin therapy treatment with topical Syzygium aromaticum essential ointment apply in rats.

Group V: Streptozotocin induced infected wound insulin therapy treatment with topical Rosadamacena essential ointment apply in rats.

Group VI: Streptozotocin induced infected wound insulin therapy treatment with topical Lavandular officnalis essential ointment apply in rats.

Group VII: Streptozotocin induced infected wound insulin therapy treatment with Topical triple combined SRL essential ointment apply in rats.

Group VIII: Streptozotocin induced infected wound treatment topical Syzygium aromaticum essential ointment apply in rats.

Group IX: Streptozotocin induced infected wound treatment topical Rosadamacena essential ointment apply in rats.

Group X: Streptozotocin induced infected wound treatment topical Lavandular officinalis essential ointment apply inrats.

Group XI: Streptozotocin induced infected wound treatment with topical triple combined SRL essential ointment apply inrats.

DIABETES PRODUCTION

After 36 hours of food deprivation, the diabetic group were Streptozotocin injected (60 mg/kg of body weight). 30 minutes after injection, food and water were offered again. The injected animals were controlled 3 days after injectionto verify the presence of glicosuria (test tape). All animals with comproved glucosuria were considered diabetic. Animals with similar age and weight were controls. Theanimals with diabetes were separated into 11 groups of animals

excision wound model selected topical essential ointment apply effective wound healing activity experimental wistar rats. Group I Negative wound control in rats, Group II Streptozotocin induced infected wound control in rats, Group III - VII Streptozotocin induced infected wound insulin therapy treatment control and Streptozotocin induced infected wound insulin therapy treatment with topical *Syzygium aromaticum, Rosadamacena , Lavandular officinalis* essential ointment and triple combined SRL ointment apply wound healing activity, Group VIII – XI Streptozotocin induced infected wound without insulin therapy only topical *Syzygium aromaticum, Rosadamacena* and *Lavandular officinalis* essential ointment apply wound healing activity and triple combined SRL ointment.

INSULIN THERAPY

Subcutaneous injection of insulin (0.1U long duration insulin Humulin-Lilly), 100g body weight every two days. The Group III-VII animals were kept under insulin therapy for 15 days before wound surgery.

PREPARATION OF OINTMENTS

The general method of preparation of various ointments of essential oil was as follows: Dried extract was taken in glass mortar and triturated first. Then small parts of PEG-400 were added with triturating to dissolve or to suspend the drugs. Portions of PEG-6000 (melted at 70°C) were added to above dispersion with triturating to form a homogenous mass of desired consistency.[2]

EVALUATION OF EVALUATION OF OINTMENTS FOR PHYSICOCHEMICAL PARAMETERS pH

The pH of all the ointments was determined using digital pH meter. 0.5 g of the weighed formulation was dispersed in 50 ml of distilled water and the pH was noted.

HOMOGENEITY

All the developed ointments were tested for homogeneity by visual inspection. They were tested for their appearance with no lumps.[11]

SKIN IRRITATION TEST

For each cream, five human volunteers were selected and 1 g of weighed formulation was applied on an area of 2 sq. inch to the back of the hand and covered with cotton. The volunteers were asked to report after 24 hours to observe for any reaction or irritation.[11]

EXCISION WOUND MODEL WOUND CONTRACTION STUDIES

Wound contraction studied on different group of animals experimental studied, Group I Negative wound control in rats, Group II Streptozotocin induced infected wound control in rats, Group III-VI Streptozotocin induced infected wound insulin therapy control and Streptozotocin induced infected wound insulin therapy treatment with topical *Syzygium aromaticum*, *Rosadamacena* and *Lavandular officinalis* essential ointment apply wound healing activity, Group VII – IX Streptozotocin induced infected wound without insulin therapy only topical *Syzygium aromaticum*, *Rosadamacena* and *Lavandular officinalis* essential ointment apply wound healing activity in excision wound model, A circular piece (mm^2 in area) of full thickness skin was excised from the dorsal interscapular region.[6] Wound contractions were monitored by measuring wound area, on alternate days till the wound were completely healed to have uniform parameters for comparison of the effects of different drugs was calculated by Litchfield and Wileoxon method.[5]

The time taken for epithelialization was measured in days required for full epithelialization was indicated by fall of scale leaving no raw wound behind. The progressive changes in wound area are monitored planimetrically bytracing the wound margin on graph to determine the change in healing of wound measurement of wound area on graph paper is expressed as unit (mm^2).[15,9]

STATISTICAL ANALYSIS

All the data were analyzed as per the method of pillai and sinha (1986).[12]

RESULTS AND DISCUSSION

The results was obtained Table – 1 & 5 in the present investigation. Streptozotocin induced animalshyperglycemia in blood glucose level were observed on the different groups of albino wistar rats. The evaluation of wound model and wound contraction studies a circular piecein area of full thickness skin was excised from the dorsal interscapsular region of wound creation interscapular region. Wound contractions were monitored by measuring wound area, on alternate days till the wound were completely healed to diabetic stress biochemical parameters for comparison of the effects of essential ointment was calculated by Litchfield and Wileoxon method.[17,3]

In different groups of animals diabetic wound healing activity selected herbal plants essential ointment used in diabetic animals excision wound model wound contraction studied on

different group of animals experimental studied, Group II Streptozotocin induced infected wound control in rats, Group III-VI Streptozotocin induced infected wound insulin therapy control and Streptozotocin induced infected wound insulin therapy treatment with topical *Syzygium aromaticum*, *Rosadamacena* and *Lavandular officinalis* essential ointment apply wound healing activity, Group VII Streptozotocin induced infected wound with insulin therapy only topical apply in triple combined SRL ointment wound healing activity, Group VIII – X Streptozotocin induced infected wound without insulin therapy only topical *Syzygium aromaticum*, *Rosadamacena* and *Lavandular officinalis* essential ointment apply wound healing activity, Group XI Streptozotocin induced infected wound only topical apply in triple combined SRL ointment wound healing activity and compared to studies Group – I Negative control wound healing activity in albino wistar rats.[14,16]

Syzygium aromaticum, essential ointment only topical apply in insulin therapy treatment with diabetic infected wound animals used for 16th days diabetic wound healing activity very highly effective on the herbal plants, *Rosadamacena* and *Lavandular officinalis* essential ointment only topical apply in insulin therapy treatment with diabetic infected wound animals used for 18th days effective on the herbal plants diabetic wound healing activity and triple combined SRL ointment topical apply in insulin therapy treatment with diabetic infected wound animals used for 14th days very more highly effective on the herbal combination plants.[7,18]

Syzygium aromaticum, essential ointment topical apply in diabetic infected wound animals used for 18th days very effective on the herbal plants diabetic wound healing activity, *Rosadamacena* and *Lavandular officinalis* essential ointment only topical apply in diabetic infected wound animals used for 20th days effective on the herbal plants diabetic wound healing activity, Triple combined SRL ointment topical apply in diabetic infected wound animals used for 16th days very highly effective medicinal plants diabetic wound healing activity.[5]

Table 1: The Wound Area (Mm^2) Normal wound control compared Diabetic Induced Wound Control and Diabetic Induced Wound Insulin Therapy Treatment control.

Experimental Rats	2nd	4th	6th	8th	10th	12th	14th	16th	18th	20th
Normal Wound Control	225±2.16	215±2.14	175±1.51	140±0.50	75±1.20	37±1.17	18±0.24	9.0±0.20	0.00	-
Diabetic Induced Infected Wound Control	225±2.18	232±2.23	236±2.40	244±2.46	248±2.42	256±2.52	252±2.56	246±2.40	237±2.28	228±2.20
Diabetic Induced Infected Wound Insulin Therapy Control	234±2.30	245±2.46	256±2.54	240±2.36	232±2.25	225±2.20	218±2.16	212±2.08	204±2.00	195±1.20

Values are mean ± SD of 6 individual observations. Value are significant at P <0.05.

Table 2: The Wound Area (Mm^2) Streptozotocin Induced Infected Wound Insulin Therapy Treatment With Topical *Syzygium aromaticum*, *Rosa damascena* and *Lavandula officinalis* Ointment apply on wound healing activity.

Experimental Rats	*2nd*	*4th*	*6th*	*8th*	*10th*	*12th*	*14th*	*16th*	*18th*
Diabetic Induced Infected Wound Treatment with Insulin Therapy and Topical *Syzygium aromaticum* Ointment	225±2.15	170±2.08	135±1.24	75±1.00	35±0.70	16±0.54	8.00±0.27	0.00	-
Diabetic Induced Infected Wound Treatment with Insulin Therapy and Topical *Rosa damascena* Ointment	228±2.20	182±2.12	138±1.28	84±1.12	42±0.75	25±0.58	15±0.46	8.00±0.24	0.00
Diabetic Induced Infected Wound Treatment with Insulin Therapy and Topical *Lavandula officinalis* Ointment	224±2.18	178±2.05	136±1.26	78±1.08	46±0.86	22±0.75	13±0.54	7.00±0.26	0.00

Values are mean ± SD of 6 individual observations. Value are significant at P <0.05.

Table 3: The Wound Area (Mm^2) Streptozotocin Induced Infected Wound Insulin Therapy Treatment With Topical SRL triple combined 1:1:1 concentration Ointment and compared in *Triple combined* Ointment apply on wound healing activity.

Experimental Rats	2nd	4th	6th	8th	10th	12th	14th
Diabetic Induced Infected Wound Treatment with Insulin Therapy and Topical *SRL triple combined* Ointment	220±2.18	156±1.54	64±1.48	35±1.20	18±0.58	9.00±0.24	0.00

Values are mean ± SD of 6 individual observations. Value are significant at P <0.05.

Table 4: The Wound Area (Mm^2) Streptozotocin Induced Infected Wound Treatment only Topical SRL triple combined 1:1:1 concentration ointment and compared in *Triple combined* ointment apply on wound healing activity.

Experimental Rats	2nd	4th	6th	8th	10th	12th	14th	16th
Diabetic Induced Infected Wound Treatment with Topical *SRL triple combined* Ointment	224±2.08	182±1.76	146±1.65	82±1.38	38±0.76	19±0.54	9.00±0.24	0.00

Values are mean ± SD of 6 individual observations. Value are significant at P <0.05.

Table 5: The Wound Area (Mm^2) Streptozotocin Induced Infected Wound Treatment only Topical *Syzygiumaromaticum*, *Rosa damascena* and *Lavandulaofficinalis* Ointment apply on wound healing activity.

Experimental Rats	*2nd*	*4th*	*6th*	*8th*	*10th*	*12th*	*14th*	*16th*	*18th*	*20th*
Diabetic Induced Infected Wound Treatment with Topical *Syzygium aromaticum* Ointment	228±2.25	220±2.15	182±1.78	148±1.46	78±0.65	36±0.56	19±0.28	8.00±0.24	0.00	-
Diabetic Induced InfectedWound Treatment with Topical *Rosa damascene* Ointment	225±2.20	214±2.06	190±1.76	173±1.65	140±1.34	78±0.68	36±0.56	19±0.54	9.00±0.26	0.00
Diabetic Induced InfectedWound Treatment with Topical *Lavandula Officinalis* Ointment	230±2.28	218±2.12	195±1.70	178±1.60	144±1.38	75±0.62	34±0.54	18±0.56	8.00±0.24	0.00

Values are mean ± SD of 6 individual observations. Value are significant at P <0.05.

CONCLUSION

It is highly effective wound healing activity and insulin therapy treatment with *Syzygium aromaticum*, *Rosadamacena* and *Lavandular officinalis* diabetic wound healing activity then triple combined ointment 1:1:1 ratio SRL (*Syzygium aromaticum*, + *Rosadamacena* + *Lavandular officinalis*) used for very more effective medicinal plants diabetic wound healing activity. It is complementary study that is also apply to humans.

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