

This study demonstrates a constant quality of care provided 24 hours per day, 7 days per week in the participating hospital.

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References

1. Al-Ghamdi AS. Emergency medical service rescue times in Riyadh. *Accid Annal Prev* 2002; 34: 499-505.
2. HU SC, Wang LM. Study of patients arriving by ambulance in Taipei city. *J Formos Med Assoc* 1993; 92 Suppl 1: S25-S32.
3. DeSalvo A, Rest SB, Nettleman M, Freer S, Knight T. Patient education and emergency room visits. *Clin Perform Qual Health Care* 2000; 8: 35-37.
4. Rabin DL, Spector KK, Bush PJ. Ambulatory care in the community. *Public Health Rep* 1980; 95: 511-519.
5. Schappert SM. Ambulatory care visits to physician offices, hospital outpatient departments, and emergency departments: United States, 1997. *Vital Health Stat* 13 1999; i-iv: 1-39.
6. Steen-Hansen JE, Folkestad EH. How long does it take for an ambulance to arrive? *Tidsskr Nor Laegeforen* 2001; 121: 904-907.
7. Harrison JF, Cooke MW. Study of early warning of accident and emergency departments by ambulance services. *J Accid Emerg Med* 1999; 16: 339-341.
8. Altintas KH, Bilir N. Ambulance times of Ankara emergency aid and rescue services, ambulance system. *Eur J Emerg Med* 2001; 8: 43-50.
9. Breen N, Woods J, Bury G, Murphy AW, Brazier H. A national census of ambulance response times to emergency calls in Ireland. *J Accid Emerg Med* 2000; 17: 392-395.
10. Brodsky H, Hakkert AS. Highway fatal accidents and accessibility of emergency medical services. *Soc Sci Med* 1983; 17: 731-740.
11. Guenther S, Waydhas C, Ose C, Nast-Kolb D. Quality of multiple trauma care in 33 German and Swiss Trauma centers during a 5-year period: Regular versus on-call service. *J Trauma* 2003; 54: 973-978.
12. Hu SC, Tsai J, Kao WF, Chern CH, Yen D, Lo HC, et al. Three years experience of Emergency medical services in Ilan County. *J Formos Assoc* 1995; 94 Suppl 2: S87-S93.
13. Jones AP, Bentham G. Emergency medical service accessibility and outcome from road traffic accidents. *Public Health* 1995; 109: 169-177.
14. Morrissey MA, Ohsfeldt RL, Johnson V, Treat R. Trauma patients: an analysis of rural ambulance trip report. *J Trauma* 1996; 41: 741-746.

New intralesional therapy for basal cell carcinoma by 2% zinc sulphate solution

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Basal cell carcinoma (BCC) is the most common skin tumor all over the world.^{1,2} There are many standard therapeutic modalities used in treatment of BCC including surgical excision, curettage with electrodesiccation, cryotherapy, and radiotherapy.^{1,2} Moreover topical remedies such as 5-fluorouracil, tazarotene, imiquimod and topical photodynamic (5 ALA) also have been used.^{1,2} Intralesional therapies have been tried using interferon alfa (2a, 2b) and cytotoxic drugs such as 5-fluorouracil, bleomycin; however many side effects were encountered with these medications.^{1,2} Zinc sulphate 2% solution has been used successfully in treatment of cutaneous leishmaniasis and verrucae vulgaris by intralesional infiltration.^{3,4} The aim of present work is to evaluate therapeutic effects, safety and cosmetic results of intralesional zinc sulphate (2%) solution in the treatment of BCC.

This is an open-label case interventional study conducted at the Department of Dermatology and Venereology, Baghdad Teaching Hospital, between March 2002 and March 2003. Formal consent was obtained from all treated patients. A detailed history was taken from each patient regarding the following points: age, gender, address, duration of the disease and the number of the lesions. Symptoms related to the lesion such as pain, itching and tenderness were recorded. Patients were also assessed to determine sites involved, size, numbers and characters of the lesions. Large lesions exceeding 1.5 x 1.5 cm in diameter were not recruited. Shaving or incisional biopsies were performed for histopathological confirmation of the disease for each patient. The preparation of 2% and 4% zinc sulphate solution (ZnSo4.7H2O) were carried out by dissolving of zinc sulphate powder (ZnSo4.7H2O) in 98 and 96 mls of sterile distilled water and autoclaved at 95°C for 20 minutes and kept in the hospital for use until the end of this study. Two percent Xylocaine solution as local anesthetic was mixed with 4% zinc sulphate solution to reach the final concentration of 2% and used to abolish the pain during injection in a number of lesions. Seventy percent ethanol was used as topical antiseptic agent before injection. Disposable syringe with 27-gauge needle was used. The lesion

was fully infiltrated with the drug thoroughly until complete blanching was achieved in case of nodular and superficial types while in noduloulcerative lesions they were injected at the periphery towards the center. The amount of solution required was 0.1-2 ml and occasionally more depending on the size of the lesion. Acral parts of the body such as tip of the nose were avoided and also deep subcutaneous injection was not encouraged to avoid necrosis of deep tissue. Patients were seen at 2-week interval and injections were repeated when it is needed. Excisional biopsies were taken from 5 clinically cured lesions after 4 months following injections. At the end of the 8 months of follow up, all patients with treated BCC were re-evaluated for any possibility of relapse.

Eleven patients (10 males and one female) with BCC were included in this study; they had 100 lesions ranging from 1 to 46 per patient (one of the patient had Gorlin's syndrome) with a mean \pm SD of 13.72 \pm 9.18 median of 2. Their ages range from 46 to 70 (61.18 \pm 9.60) while the duration of the disease was between 7 months and 36 years (11.35 \pm 8.49) (median: 2). A total of 100 lesions of BCC, 48 [48%] nodular, 45 [45%] superficial pigmented, 6 (6%) noduloulcerative and one (1%) cystic were infiltrated with zinc sulphate solution. Thirty lesions were injected with 2% zinc sulphate solution while 70 lesions were infiltrated with 4% zinc sulphate solution and 2% Xylocaine. The sites of lesions were 43 (43%) on the scalp, 34 (34%) on the face, 21 (21%) on the cheek and 2 (2%) on the chest. The number of injections for each lesion ranged from 1-4 injections (2.06 \pm 0.961). All lesions showed clinical cure: 18 (18%) lesions after first injection, 52 (52%) lesions after second injections, 29 (29%) lesions after third injections and one (1%) lesion after the fourth injection. The infiltration without Xylocaine was painful for few minutes in all treated lesions. Local redness swelling and tenderness were observed in all; lesions showed local necrosis with formation of black eschar that stayed for 10-14 days and then fell down as shown in **Figure 1a and 1b**, leaving atrophic scar, which gradually disappeared over time leaving a good cosmetic appearance at the end of 8 months, follow up. Any patients complained no systemic side effects. In 4 patients, the itching and tenderness of the lesion were disappeared after the first injection of zinc sulphate solution. Follow up for 8 months showed no relapse in all treated lesions. Biopsies from 5 treated lesions after 4 months of follow up showed no residual malignant cells. The present work showed that local injection of BCC with 2% zinc sulphate solution provide

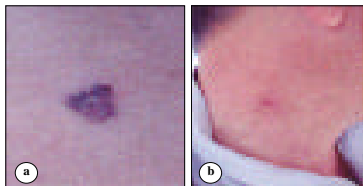


Figure 1 - A solitary lesion of basal cell carcinoma on the neck a) before treatment b) 4 weeks after injections.

encouraging results, this local infiltration often cause local necrosis and death of the tumor cells.^{3,4} The mechanism of action cannot be speculated, although it has been reported that zinc sulphate has local cytotoxic effects.⁵ Similarly zinc sulphate cause local necrosis in treatment of verrucae vulgaris and cutaneous leishmaniasis through intralesional way.^{3,4} So the mode of action of local injection is mainly through necrosis of lesional tissue.^{3,4} The number of injections needed was 1-2 injection to achieve the cure. The maximum duration of healing is maximum one month after the first or second injections. This therapy lacks any local side effects apart from swelling and erythema. Also, no systemic side effects were observed in any patient. The results of local injection with other drugs like bleomycin and interferon alfa were not encouraging in addition to the systemic side effects such as flue or illness that are associated with local injection of these remedies. Also they take longer duration to achieve healing of lesions in comparison with 2% zinc sulphate solution infiltration.^{1,2} These drugs might be costly when compared with local 2% zinc sulphate solution. Thus, this new mode of management seems to be a very successful therapy of skin tumors such as BCC; and it should be advised in treatment of all cases of BCC especially in elderly individuals, when tumors are multiple and small size. Intralesional zinc sulphate is a safe, inexpensive, non-surgical and can be performed easily even by general practitioner with excellent cosmetic results. The mode of action cannot be speculated but it definitely works through inducing local necrosis of lesional tissue.

In conclusion, this is a new effective, safe, non-costly local therapy of BCC. It is advised in all patients and in all types of BCC especially when the number of lesions is multiple, small and in elderly individuals.

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References

1. Odon RD, James WD, Berger TG. Epidermal Nevi, Neoplasms and Cysts. In: Andrew's Diseases of the skin: Clinical dermatology. 9th ed. Philadelphia (PA): WB Saunders Company; 2000. p. 800-868.

2. Mackie RM. Epidermal skin tumors in textbook of dermatology. 6th ed. Oxford: Blackwell Science Ltd; 1998. p. 1651-1693.

3. Sharquie KE, Najim RA, Farjou IB. A comparative controlled trial of intralesionally administered zinc sulphate, hypertonic solution chloride and pentavalent antimony compounds against a case cutaneous leishmaniasis. *Clin Exp Dermatology* 1997; 22: 169-173.

4. Sharquie KE, Al-Nuaimy AA. Treatment of viral warts by intralesional injection of zinc sulphate. *Ann Saudi Med* 2002; 22: 26-28.

5. World Health Organization. Zinc: Environmental Health Criteria. Geneva: WHO; 2001. p. 250.

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Errata

In manuscript "Combined parathyroid adenoma and an occult papillary carcinoma" Saudi Medical Journal 2004; Vol. 25 (11): 1707-1710, the authors names should have appeared as follows: Abdul-Wahed N. Meshikhes, Sohail A. Butt, Basima A. Al-Saihati.

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