قسم صحة ورعاية الحـــــيوان
كلية الطب البيطري ـ جامعة الزقازيق
رئيس القسم : أ٠د / جمـــال العليمي

دراسة تأثير نيوسيدول (مبيد حشري) على البكتريا الملوثة لجلد ولبن الابقار ذات الاهمية الصحية العامة

أحمد البسيوني ، على الجد ، عادل خالد ، فكري فؤاد*، جمال العليمي

فى هذه الدراسة تم اجراء الفحص البكتريولوجي لـ ٥٠ مسحه من جلود أبقار سليمه وكذلك لـ ٣٠ عينه من ألبانها وذلك قبل وبعد رش الابقار بالنيوسيدول ٠

ولقد أوضح الفحص البكتريولوجي قبل الرش عن ايجاد كمية كبيرة من الحمل البكتيري على الجلد (٦٨×١٠^{١١}) وفى اللبن (٩٠×١٠^{٥}) كما تم عزل الميكروب العنقودي الذهبى (١٦٪) والميكروب السبحي المذيب للدم (١٤٪) من على الجلد وكذلك من الالبان بنسبة ١١,٦٪و١٠٪ على التوالـــي ٠

أما بعد الرش بالنيوسيدول فلقد وجد أن العدد الكلي للبكتيريا المعزولة من الجلد واللبن قد قل بنسبة عالية جدا (حوالي ٩٩٪) فى حين أبدي الميكروب الذهبي العنقودي مقاومة للنيوسيدول حيثت تم عزله بعد الرش بنفس النسبة قبل الرش ، أما الميكروب السبحي المذيب للدم فلقـــد أظهر حساسية عالية للنيوسيدول ٠

أيضا تم دراسة حساسية العدد الكلي للبكتيريا المعزولة من جلود الابقار معمليابإضافـــة النيوسيدول اليهـــا ٠

فقد وجد أن للنيوسيدول تأثيرا كبير على العدد الكلي للبكتيريا حيث تم تقليلها بنسبـــة عالية جدا ٠

وبهذا يقلل من دور جلود والبان الابقار فى نقل الامراض للانسان والحيوان على السواء ٠

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* مركز البحوث الزراعية ـ سخـــــا ـ كفر الشيخ

Dept. of Hygiene, Preventive Medicine & Microbiology,
Faculty of Vet. Med., Zagazig University, Moshtohor,
Head of Dept. Prof. Dr. G. El-Olemy.

BACTERICIDAL EFFECT OF NEOCIDOL ON THE BACTERIAL LOAD OF COW'S SKIN AND MILK

(With 2 Tables & 1 Fig.)

By
A.A. EL-BASSIOUNY; A.S. EL-GAD; A.M. KHALID; F.M. FOAD* and G. EL-OLEMY

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SUMMARY

Bacteriological examination of cow's skin and milk denoting the presence of different types of bacteria specially Staph. aureus, Strept. pyogenes. The bactericidal effect of NEOCIDOL 60 E-C (Diazinon, Ciba - Geigy) on total bacterial count, Staph. aureus and Strept. pyogenes isolated from cows skin and milk was investigated either in Vitro or in Vivo. Neocidol was highly effective on the total bacterial count and Strept. pyogenes while Staph. aureus was resistant to it. The public health importance of existing microorganisms as well as suggestive control measures were discussed.

INTRODUCTION

Skin and milk of cow were found to be contaminated with many pathogens of quite vital importance due to their association with many diseases of man and animals. Staphylococcus aureus and Streptococcus pyogenes were the most common associated potential pathogens of the skin and milk (MARZOIK, et al. 1980 and EL-GHANAM, et al. 1983).

Such pathogens gain access to milk from the body of the cow particularly from flanks and udder, the cow's body may contribute as many as 10.000 bacteria to ml of milk (CLARENCE, et al. 1982).

The eradication of skin parasites of the live stock is a main and routine object of veterinary service. It was reported that some of insecticides had a bactericidal effect (AEHNELT, 1955 and LANGLOIS and SIDES, 1972).

EL-OLEMY, et al. (1984) studied the effect of NEOCIDOL as a bactericide on Staph. aureus and Strept. pyogenes in Vitro. Therefore, this work was planned to secure informations of the efficiency of NEOCIDOL as a bactericide either in Vivo on Staph. aureus and Strept. pyogenes or in Vivo and in Vitro on the total bacterial count of skin and milk due to their public health importance.

* Agriculture Research Centre, Sakha, Kafer El-Sheikh.

MATERIAL and METHODS

Just before NEOCIDOL application, 50 healthy cows with apparently normal skin and udder at Sakha farm, KAFER El-Sheikh, Egypt were subjected to skin swabs, moreover, 30 milk samples were taken.

Skin swabs:

Under aseptic conditions, moist swabs were collected from flank regions using a sterile plastic sheet with an opening measured 6 cm^2 to limit the chosen area of sampling.

All swabs were immersed in sterile tubes containing 6 ml. Sterile saline solution and immediately transferred to the laboratory.

Milk samples:

One pool milk sample was collected from the four quarters of each cow (SCHALM, et al. 1971).

Total bacterial count:

Serial ten fold dilutions were carried out from the original sample using sterile saline up to the dilution 10^{-12} in skin swab and up to 10^{-6} in milk sample (according to preliminary investigation). Agar plates were prepared from each respective dilution and were incubated at 37°C for 24 hours. Plates showing 30 to 300 colonies were chosen for counting.

The number of colonies per one ml of each diluted sample was multiplied by its dilution factor to obtain the total viable bacterial count at 37°C per 1 ml.

Detection of Staph.aureus and Strept.pyogenes:

It were carried out according to WILSON and MILES (1974), CRUICKSHANK, et al. (1975) and BAILY and SCOTT (1978).

Application of NEOCIDOL:

1 - **In Vivo:**

Cows were sprayed with NEOCIDOL diluted by water (one per thousand), at the limited sampling area of flank region. Rimmed plastic capsculs (10 cm diameter X 4 cm high, covered with gauze and tied with rubber band) were adjusted tightly to prevent any external contamination.

After 6 hours from NEOCIDOL application, plastic capsouls were removed and swabs were collected again from the same places, as well as milk samples were taken under the same conditions.

2 - **In Vitro:**

One of the original samples taken from skin swabs was tested for its bacterial count which amounted to 10^{-11} /ml was dibided into 2 equal portions. One of the aliquest was treated with NEOCIDOL to reach a final dilution of 1/1000 while the 2nd portion was left as control. Both samples were kept at room temperature (22°C), 1 ml samples were taken from each tube at 0, 2, 4, 6, 8 hours and were tested for their bacterial count as previously described.

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RESULTS

I - **Bacteriological findings of cow's skin and milk:**

a - **Before NEOCIDOL application:**

The mean total bacterial count of skin in 1 cm^2 and milk per 1 ml were $68x10^{11}$ and $90x10^{5}$ respectively. Out of 50 skin swabs, Staph. aureus was isolated from 8 samples (16%) and Strept. pyogenes from 7 samples (14%), while from milk samples 4(11.6%) and 3(10%) respectively as shown in table (1).

b - **After NEOCIDOL application:**

The mean total bacterial count became $52x10^{6}$ per 1 cm^2 of skin and $63x10^{3}$ per 1 ml of milk. Staph. aureus was reisolated from the same samples (16% of skin swabs and 11.6% of milk samples), while Strept. pyogenes was not reisolated from skin swabs and reisolated only from one sample of milk (3.3%), as shown in table (1).

II - **The effect of NEOCIDOL - in Vitro - on the total bacterial count:**

The results indicate that the total bacterial count was highly reduced by NEOCIDOL as shown in table (2) and Fig. (1).

Table (1)
Bacteriological findings of cow's skin and milk

Sample type	No. of samples	Before NEOCIDOL application: Mean total bacterial count	Staph. aureus Posit.	%	Strept.pyogenes Posit.	%	After NEOCIDOL application: Mean total bacterial count	Staph. aureus Posit.	%	Strept.pyogenes Posit.	%
Skin swabs	50	$68 \times 10^{11*}$	8	16	7	14	$52 \times 10^{6*}$	8	16	-	-
Milk samples	30	$90 \times 10^{5**}$	4	11.6	3	10	$63 \times 10^{3**}$	4	11.6	1	3.3

* Per 1 cm^2. ** Per 1 ml.

- Posit. = Positive
- % of the positive samples was calculated according to the number of the examined samples.

Table (2)
Effect of NEOCIDOL on total bacterial count of cow's skin in Vitro

Time intervals in hours	Total bacterial count per 1 ml sample	
	Treated with NEOCIDOL	Control
0	10^{11}	10^{11}
2	10^{8}	10^{11}
4	10^{6}	10^{11}
6	10^{6}	10^{11}
8	10^{6}	10^{11}

DISCUSSION

The results points out that skin and milk of apparently normal and healthy cows proved to be a potential source of pathogenic microorganisms as well as heavy load of bacteria. These findings were confirmed by NASR (1956), AYEBO, et al. (1976), MARZOUIK, et al. (1980), PANDLY and MANDOL (1980) and EL-GHANAM, et al. (1983).

Regarding to the effect of NEOCIDOL on the bacterial load of skin and milk, it was clear that it had a good bactericidal effect either in Vivo or in Vitro, many authors recorded this effect using another insecticides (SMITH and WENSOL, 1947 and ANGELOTTI, et al. 1954).

Concerning Strept. pyogenes reisolation after NEOCIDOL atomization, was not recorded from skin swabs while milk samples decreased from 3 positive samples to one.

At the same time Staph. aureus could be reisolated from cows skin and milk samples after the application of NEOCIDOL.

These finding denoting that NEOCIDOL was effective on Strept. pyogenes while Staph. aureus was resistant to its action. These results were in agreement with that reported in Vitro by EL-BAYOMI (1977) and EL-OLEMY, et al. (1984).

After NEOCIDOL application about 99% of the total bacterial count was reduced of skin samples. Lastly one may safely conclude that without any excess of money, time or effort, the application of insecticides in our veterinary practice is helpful not only in control of external parasites but also for some pathogenic bacteria. So we suggest to check the antibacterial effect of other insecticides for feild application.

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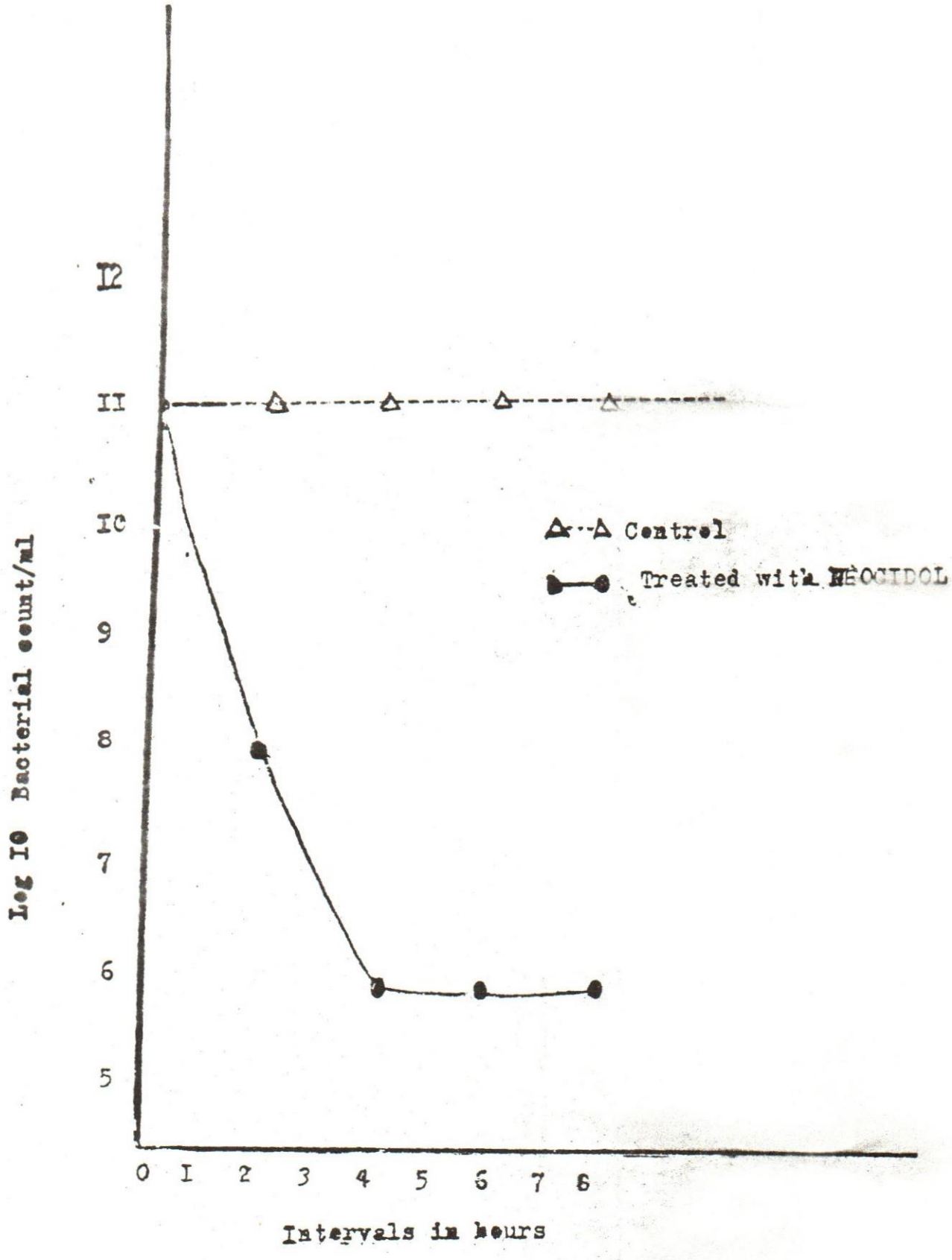

Fig. (1)

Inactivation rate in total bacterial count of cow's skin in Vitro after NEOCIDOL treatment