



## TOXICITY OBSERVED IN SOME COMMERCIAL DETERGENTS COMMONLY USED IN LIBYA

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### **ABSTRACT**

Commercial detergents are available in plenty , and the toxic effects to humans is studied experimentally on an animal and compared for its effects on humans.The study is aimed for the possible toxic effects resulting from the misuse of Lyarkina solution used as a detergent .The inflammatory effect is caused by Lyarkina which is a solution of Sodium hypochlorite with or without sodium hydroxide solution  
*Objective* :The possible toxic effects resulting from the misuse of Lyarkina solution used as a substitute for detergents .

*Experimental set-up* : Derna Hospital ,Omar El-Mukthar university ., Derna .

*Methods* : The inflammatory effects of Lyarkina on experimental animals (Rabbits) and on humans is studied .The number of patients on whom the experiment is performed crossed over 100 , and 50% were females .

*Results* : The study revealed that in most patients the inflammation of the skin was evident by severe itching caused by severe irritation and in some patients the eczematic reactions were observed . Even psychological effects were also observed ,where some vegetables ,citrus fruits , garlic and onions influenced the toxicity .

*Conclusion*: The study confirmed the toxic effects to humans on misuse of the Lyarkine solution and should be avoided and replaced by the regular detergents .

### **KEYWORDS**

Detergents ,Lyarkina , Eczematic reaction ,Skin inflammation , Prevention, Sodium Hypochlorite

### **INTRODUCTION**

Lyarkine solution is more used abundant detergent in Libya for the purpose of cleaning , bleaching and removal of dirt's from substrates .

This solution consists of Sodium Hypochlorite solution in water having a concentration of 11.1 % (W/V) .Other regular detergent solution consists of only 10%(W/V) Sodium Hypochlorite and



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10%(W/V) Sodium Hydroxide in water with a  $P^H$  of 9-11.

### EXPERIMENT

**1.Experimental Animals :** Seven male rabbits aging from 20days to 30days are used for the experiments . They were fed with water ad-lib and fresh vegetables .The experiment was conducted for 14 days with the same condition maintained for the complete duration of time . The experimental Lyarkina solution was applied to the animals on the left thigh as it presented a large area . The animals were exposed to lyarkina solution for 15 minutes at

an interval of 24 hours ,one week and two weeks and the changes was observed and photos are taken by a digital camera . Then the hair was removed and the naked skin was wetted with the experimental Lyarkina solution of a period of 10 minutes for 14 days . After 10 minutes of exposure to Lyarkina solution the skin of the animal was washed with distilled water , since the females who use the solution wash after few minutes of exposure . One animal was used as a placebo .The results are illustrated in Table 1 .

Table : 1

### CLINICAL OBSERVATION OF THE ANIMALS AFTER EXPOSURE TO THE LYARKINA SOLUTION

Results	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Symptoms after exposure to dilute Lyarkina solution	Mild redness to the skin	Redness increased with dark spots appearance	Severe redness to the skin with formation of ulcer	Brownish decolorization with dry shrunk skin	Formation of brownish dry scar and shrinking of skin	Inflammation under the scar ,but disappearance of the scar
	<b>Day 7</b> Inflammation under the scar ,but disappearance of the scar	<b>Day 8</b> Slight damage of skin under the scar	<b>Day 9</b> Disappearance of scar and formation of another scar	<b>Day 10</b> Slight damage and reform of new scar	<b>Day 11</b> Mild inflammation susceptible to curing	<b>Day 12</b> Mild inflammation in the surrounding of the scar .



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Results	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Symptoms after exposure to concentrated Lyarkina solution	Within 10 minutes of application the animal started bleeding , and ulcers observed after 15 minutes and inflammation of the skin	Severe ulceration with dark spots and shrinkage of the skin with transparent exudations	Severe inflammation with transparent exudations	Severe inflammation with transparent exudations	Severe inflammation with transparent exudations	Animal unable to move the thigh
	<b>Day 7</b>  Animal unable to move the thigh with increase in inflammation	<b>Day 8</b>  -----	<b>Day 9</b>  -----	<b>Day 10</b>  -----	<b>Day 11</b>  -----	<u>Day 12</u>  -----

### DISCUSSION

From the above results it is evident that Lyarkina solution is a strong irritating agent .The concentrated solution showed severe symptoms evidenced by the skin changing into redness ,

ulceration (appearance of dark dots) ,bleeding and secretion of transparent exudates .The symptoms increased even to the extent that the animals were unable to move the left thigh.This indicates the possible irritation to cause

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the humans if they use the concentrated Lyarkina solution .So the further experiments were conducted on humans with the same concentration level used on animals .



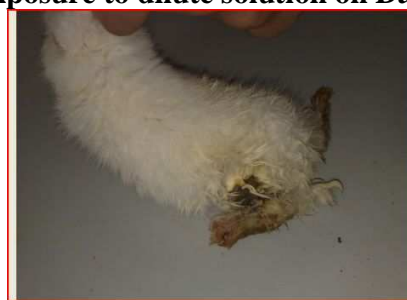
**Animals before exposure to LYARKINA  
solution**



**Exposure to dilute solution on Day 8**



**Exposure to dilute solution on Day 1**



**Exposure to dilute solution on Day 12**



**Exposure to dilute solution on Day 3**



**Exposure to concentrated solution on Day 1**

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**Exposure to concentrated solution on Day 3**



**Exposure to concentrated solution on Day 5**



**Exposure to concentrated solution on Day 7**

### **2 . Observation on Humans :**

The experiment is repeated on 100 patients exposed to the same detergent solution at Derna Hospital . Out of 100 patients , 50 were males and 50 were females . The observation was conducted on the patients for the possible skin reactions and in some cases for ever respiratory changes . The results are illustrated in Table 2 –



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Table 2

### *CLINICAL OBSERVATION OF PATIENTS EXPOSED TO LYARKINA SOLUTION*

PATIENTS	MALE	FEMALE	P
<b>Suffering</b>	24	38	>0.1
Normal	40	32	>0.1
May suffer	36	30	>0.1
<b>Using Gloves</b>	12	12	>0.025
Without Gloves	80	68	>0.025
May use gloves	8	20	>0.025
<b>Exposed for 10 min</b>	52	60	>0.0
Exposed for 15 min	18	50	>0.0
Exposed >15days	30	44	>0.0
<b>Redness of skin</b>	28	44	>0.025
Ulcers	12	12	>0.025
Other symptoms	60	44	>0.025
<b>Respiratory allergy</b>	14	16	>0.05
Did not suffer	60	52	>0.05
Occasionally	20	32	>0.05
<b>Tears due to vapour</b>	24	26	>0.05
Did not have tear	62	50	>0.05
Some times	14	24	>0.05

The use of Gloves to protect the hands was not effective in preventing , rather it increased the irritation by preventing the perspiration of the sweat from the hands .It was observed that gloves coated with cotton or felts protected the hand and reduced the irritation . Some vegetables tomato ,onion and garlic and some citrus fruits like oranges and lemon potentiated the irritation was also observed . It is advised not to use these items when

exposed or when suffering from the allergy caused by the Lyarkina solution .

### **CONCLUSION**

The Lyarkina solution should be used with great protection and it is recommended to use cotton coated gloves to protect the hands . Some



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mentioned fruits and vegetable contacts should be avoided on exposure with the Lyarkina solution .

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