

علاج التهاب الرحم المزمن فى الماشية باللوجول الیودی
مع التركيز على تأثيره على الجراثيم المسببة

م . عفیفی ، م . أبو العطا ، ط . شوطن ، س . الصواف ، ك . زكى

أخذت مسحات من ٧٣ حیوان (٣٤ بقرة و ٣٩ جاموس) مصابة بالتهاب الرحم المزمن قبل حقن محلول لوجول الیودی المركز والمخفف فى الرحم والمهبل ثم جمعت عينات مرة ثانية قبل الحقن الثانى للوجول وكررت نفس العملية للمرة الثالثة يلحق الحيوان بعد ساعتين يحقن فى المهبل بمحلول سترت - بنسید (٥٠ سم) .

وقد تم عزل ١١٩ عترة فى الأبقار بنسبة ١٠٠% (العزل الأول) وانخفض هذا العدد الى ٧٤ بعد حقن اللوجول لأول مرة ، بينما فى العزل الثالث (أى بعد استخدام اللوجول للمرة الثانية على التوالي) وصل عدد البكتريا المعزول الى ٣٠ عترة أى بنسبة ٢٥% من العدد الأصلى .

فى الجاموس تم عزل ١٥١ عترة فى العزل الأول (١٠٠%) وقل هذا العدد الى ٩٦ عترة بنسبة ٦٤% وأصبح عدد ها بعد الاستخدام الثانى للوجول ٥٦ عترة أى بنسبة ٣٧% .
وكانت أهم أنواع البكتريا التى لم تتجاوب أو لم تستجيب للعلاج سواء فى الأبقار أو الجاموس هى المكورات العنقودية الذهبية* المكورات السبحية القيحية* ، العصيات الوتدية القيحية*
عصيات القولون* وعصيات القیح الأزرق .

وقد لوحظ أن استجابة الحيوانات المصابة بالتهاب الرحم المزمن فى الدرجة الأولى للعلاج سواء باللوجول المركز أو المخفف تكون أعلى وأكثر منها فى الدرجات الثانية والثالثة فى نفس العوض .
كما لوحظ أن العلاج بمحلول اللوجول الیودی المركز يعطى نتائج أفضل بالنسبة لمعدل الاخصاب فى لوجول الیود المخفف كلما كانت الحالة العامة الصحية للحيوان جيدة أو كان التهاب الرحم من الدرجة الأولى .

* هذه التسميات أخذت من كتاب علم جراثيم الحيوان للدكتور محمد طلعت شوطن - الطبعة الأولى - منشورات جامعة حلب (١٩٧٦ - ١٩٧٧) .

Depts. of Surgery, Obstetrics and Microbiology,
Faculty of Vet. Med. Cairo University,
Heads of Depts. Prof. Dr. K. Fouad and Prof. Dr.A. Farid.

TREATMENT OF BOVINE CHRONIC ENDOMETRITIS WITH LUGOL'S IODINE
WITH REFERENCE TO ITS EFFECT ON THE CAUSATIVE ORGANISMS.
(With 5 Tables)

By

M.M. AFEEFY, M.M. ABO-EL-ATA, M.T. SHOUMAN, S. EL-SAWAF
and K. ZAKI.

(Received at 29/9/1975)

SUMMARY

From 34 cows showing chronic endometritis, 119 isolates (100%) were recorded from first isolation, reached to 74 isolants (62.2%) after first treatment and became 30 isolates (25.0%) in the 3rd isolation after the second treatment with Lugol's iodine.

Out of 39 affected buffaloes, 151 bacterial isolates (100%) were recovered from the first isolation, while after the application of Lugol's solution, either stock or diluted, 96 isolates were reported in an incidence of 64.1%. In the 3rd isolation after the second treatment, the number of isolates was reduced to 56 (37.4%).

The most predominant bacteria which did not respond to treatment in cows and buffaloes were: Staph.aureus, Str.pyogenes, C.pyogenes, E.coli and Ps.aeruginosa.

According to the responsibility of the diseased animals to treatment, it was observed that the first degree cases respond mostly to stock and diluted Lugol's solution than both the second and the third degree of chronic endometritis.

Stock Lugol's iodine gave better results regarding the conception rate than the diluted one particularly when coupled with good health condition and/ or the first degree of inflammation.

INTRODUCTION

Treatment of chronic endometritis was attempted by numerous workers. The methods applied have involved mainly the local applications of drugs to the endometrium. The chief groups of drugs employed were chemical disinfectants or counter irritants (ANOCKOR, 1879.,) LEGARI, 1931; HIGNETT, 1953 and DYARIAVA and DCUNTROV, 1970). Reproductive hormones were tried by FAULKNER (1943), BUTAYEVA (1958) and SHARAF et al. (1963). Recently, antibiotics have been tried with different degrees of success (EASLEY et al., 1951; MOULIN, 1952 and ABDEL MALEK and ZAKI, 1964).

The aim of the present study was to investigate the role of Lugol's iodine in the treatment of endometritis and its effect on the causative organisms in cows and buffaloes.

MATERIALS AND METHODS

A total of 73 (39 buffaloes and 34 cows) apparently normal and non-pregnant animals presented to Batanon Vet. Clinic, Menofia, Egypt, for infertility treatment were used in this study. The need for many services to achieve conception was the main complaint from such animals.

Every animal after being examined to determine its general condition (poor, moderate and good) was swabbed vaginally for bacterial examination and received a dose of stock or diluted intrauterine Lugol's iodine solution (150 ml). About 7-10 days later the same animal was re-examined, swabbed once more and again another dose of the same concentration of Lugol's iodine was given. The same animals were treated in the same manner for 4 or even 5 times. When rectal and vaginal examination revealed that the condition of genitalia was improved, the animal was

TREATMENT OF CHRONIC ENDOMETRITIS

- 269 -

let to be served by a fertile bull and 2-4 hrs later the animal was given an intrauterine dose (50 ml) of Streptopencid.

The number of samples collected during the treatment were summerized in table 1.

Table 1: Number of cases of chronic endometritis as regards the number of times swabbed and total of samples collected

Species of animals	No. of cases tested	Repeat breeders for				Total samples collected
		2 times	3 times	4 times	5 times	
Cows	34	18	16	--	--	84
Buffaloes	39	20	15	3	1	102

Lugol's iodine stock solution was prepared as follows: 3gm of Potassium iodide dissolved in 50 ml distilled water, then 1 gm Iodine was added and shaken well, then distilled water was added to 100 ml., while diluted Lugol's iodine solution was prepared by adding one part of distilled water to one part of the stock solution. After taking the bacterial swab, 150 ml of Lugol's iodine solution (stock or diluted) were injected in the following manner: 100 ml in the uterus, 25 ml in the cervical canal and 25 ml in the anterior vagina. The antibiotic used was in the form of one vial of Streptopencid (1,2000,000 i.u. penicillin procain, 400,000 i.u. pecillin sodium and 2 gm streptomycin sulphate) dissolved in 50 ml distilled water.

The 192 vaginal swabs collected from both cows and buffaloes were examined bacteriologically according to the technique adopted by ABO-EL-ATA (1973). The isolates were identified into species by microscopical, cultural character and biochemical reactions according to ABDEL-MALEK and GIBSONS (1948), SEELEMAN (1954), BREED *et al.* (1957), WILSON and MILES (1964), COWAN and STEEL (1965), MERCHANT and PACKER (1967) and EDWARDS and EWING (1972).

RESULTS

The results of isolation from affected cows (Table 2), revealed the recovery of 119 strains from the first isolation. In the second isolation, the number of isolates reached 74 strains (62.2%), while in the third isolation i.e. after the second applications of Lugol's iodine the number of isolants was reduced to 30 (25.0%). The most prevalent species of bacteria, which resisted treatment, were Ps.aeruginosa (6.0%), Str.pyogenes (4.2%), Staph.aureus (2.5%), E.coli (2.5), C.pyogenes (1.6%), Alpha-haemolytic streptococci (0.9%) and Str.bovis (0.8%).

As shown in table 3, it was noticed that out of 39 examined buffaloes, 151 strains of different types of bacteria were isolated from the first isolation before treatment. But after the first treatment, 96 isolates were recovered (64.1%) in the second isolation.

In the third isolation, the number of isolates recovered were 56 (37.4), from which the most predominant species were: Staph.aureus Str.zymogenes, Ps.aeruginosa (3.4% each), Str.pyogenes, K.genitalium (2.6% each) and unclassified corynebacterium (2.0%).

It is evident that the incidence of conception among buffaloes and cows treated with stock Lugol's solution was 55% and 50% respectively, while in diluted Lugol's solution the conception rate was 37% in both animals as shown in table 4.

It was also proved that all animals (buffaloes and cows) with good condition responded to the stock and Lugol's 100%, but animals with moderate health condition responded more to stock solution than the diluted one, while those with poor health were the least to respond to either treatment.

TREATMENT OF CHRONIC ENDOMETRITIS

- 271 -

From table 5, it could be observed that the first degree of endometritis responded better to treatment than the second or third degrees either by using the stock or the diluted solution. Moreover, stock solution gave better results than the diluted Lugol's iodine.

DISCUSSION

Chronic endometritis is one of the outstanding problems of bovines all over the world in which prevention is better than treatment (WILLIAMS, 1951; BENESCH and WRIGHT, 1955 and ROBERTS, 1956).

Results given in tables 2 and 3 proved that in cow's and buffaloes samples the number of strains of bacteria recovered after the first treatment decreased than the first isolation. After the second treatment the number of organisms was reduced to a minimum incidence (25% in cows and 37.4% in buffaloes). It is of importance to notice that bacteria which did not respond to treatment were: Staph.aureus, Str.pyogenes, C.pyogenes and E.coli. Moreover, infection with Ps.aeruginosa was very difficult to be treated either with Lugol's stock or diluted solution and was recovered from the same animal in successive examinations. Many workers reported the difficulty of treatment of genitalia suffering from similar infections (ASDELL, 1955; ROBERTS, 1956 and ARTHUR, 1975).

It was also found in this work that animals with good general health condition responded well to either treatment with stock or diluted Lugol's solutions, while animals with moderate or poor general health showed so variable response that the latter animals did not respond to treatment. Thus, in agreement with ASDELL (1955) and ROBERTS (1956) it could be stated that the general health condition of the animal greatly controls

its response to medication.

According to RICHTER's (1926) classification, it was observed that the first degree of endometritis responded mostly to stock or diluted Lugol's solution. On the other hand, the second and third degree cases showed different response to treatment which was better in the second than in the third degree. This has been previously reported by RIEDEL (1935), RASBECH (1950), PIETZCH (1958), DAWSON (1960), ZAKI et al. (1963) and DYARIAWA and DCUNTROV (1970).

Stock solution of Lugol's gave better results regarding the conception rate than the diluted one specially when coupled with general health condition of the animal, where it reached 100% in cows and buffaloes. These findings go hand in hand with those reported by RATTENSTEN and KIERKEGAARD (1954) who stated that Lugol's iodine in dilution 1:500 or 1:1000 was in effective but at 1:200 it was considered useful (OHM, 1955). Moreover, many authors had successfully used intrauterine Lugol's solution in the treatment of chronic endometritis and recorded pregnancy rate of about 70% (GOETZE, 1954; PIETZSH, 1958 and ZAKI et al., 1963).

It is beleived that the curative action of iodine is not only due to its counter irritant and disinfectant effect but also through its indirect effect on the pituitary stimulating the secretion of gonadotrophin and on the thyroid gland stimulating the secretion of thyroxine which improve the general body metabolism (HINGETT, 1952 and KIESSEL and DACRES, 1959). In agreement with DAWSON (1960) Lugol's iodine remains quite an effective and cheapest medication to be used in the treatment of chronic endometritis.

TREATMENT OF CHRONIC ENDOMETRITIS

- 273 -

REFERENCES

- Abd El-Malek, A.S. and Zaki, K. (1964): Effect of terramycin tablets on bacteria of puerperial infection in fres-ian cows. Arab Vet. Med. Ass., 24: 227.
- Abd-El-Malek, Y. and Gibson, T. (1948): Studies in the bacteriology of milk. J. Dairy Res., 15, 233.
- Abo-El-Ata, M.M. (1973): Studies on chronic endometritis in cows and buffaloes in Egypt. M. D. Vet. Thesis, Cairo University.
- Anockor, H. (1879): Spezielle Pathologie und Therapie fur Tierarzte. Verlag Schapper, Hannover, Cited by Zaki et al. (1963).
- Arthur, G.H. (1975): Veterinary reproduction and obstetrics. 4 th E., E.L.B.S. and Bailliere, Tindall.
- Asdell, S.A. (1955): Cattle fertility and sterility. Boston, Little, Brown and Co.
- Benesch, F. and Wright, J.G. (1955): Veterinary obstetrics. Bailliere, Tindall and Cox, London.
- Breed, R.S.; Murray, E.G.D. and Smith, N.R. (1955): Bergey's manual of determinative bacteriology. 7th Ed. Williams and Wilkins Co., Baltimore.
- Butayeva, T.M. (1958): Action of carbachol and oestrogenic preparation on the uterus of cows under experimental and clinical conditions. Lenin. Acad. Agric. Sci. , 21: 34, cited in Vet. Bull. (1959) 29: 657.
- Cowan, S.T. and Steel, K.I. (1965): Manual for identification of medical bacteria. Cambridge Univ. Press.
- Dawson, F.L.M. (1960): Bovine endometritis. Vet. J., 116: 448.

Assiut Vet. Med. J. Vol. 6 No. 11&12, 1979.

- Dyariava, Y. and Ducntrov, D. (1970): Pathological studies on the uterine wall of cows treated with a solution of silver nitrate colloidal silver and Lugol's iodine solution. *Vet. Med. Nauki., Sofia*, 7: 27.
- Easley, G.T.; Leonard, R.H. and Trotter, A. (1951): Bacteriological, pathological and clinical studies of the reproductive tract of the Herford cow and a bacteriological study of Herford bull semen. *North. Am. Vet.*, 32: 258.
- Edwards, R.R. and Ewing, W.H. (1972): Identification of Enterobacteriaceae. Burgess Publ. Co., Minneapolis.
- Faulkner, S.H. (1943): *Lancet*, 36: 78., cited by Sharaf et al., (1963).
- Goetze, R. (1954): Bekämpfung der puerperal bakteriellen Erkrankungen des Pferdes und Rindes durch die prophylaktische Therapie mit Sulfonamiden und antibiotischen Mitteln. *Proc. 15th Int. Vet. Congr., Stockholm (1954)*, Part I, pp. 733., cited in *Vet. Bull. (1955)* 25, 90.
- Hignett, P.G. (1953): Sterility in cows. *Vet. Rec.*, 65, 121.
- Kiesel, G.K. and Dacres, W.G. (1959): A study of infertility in cattle in Aloboina. *Amer. J. Vet. Res.*, 54; 760.
- Legari, E. (1931): Experimental contribution to the cure of sterility in bovine. *Clin. Vet., Milano*, 54: 47.
- Merchant, I.A. and Packer, R.A. (1967): *Veterinary bacteriology and virology. 7th Ed.*, Iowa State Collage Press, Ames, Iowa.
- Moulin, A.R. (1952): Antibiotics and artificial insemination in treatment of sterile cows. *Rec. Med. Vet.*, 128: 19.
- Ohm, A. (1955): *Inaug. Diss., Hannover*, Cited by Dawson (1960):
- Pietzsch, W. (1958): Diagnosis and therapy of chronic endometritis in cows: a comparison of Lugol's solution and saturated saline. *Inaug. Diss., Munichen*, pp. 63.

TREATMENT OF CHRONIC ENDOMETRITIS

- 275 -

- Rasbech, N.O. (1950): Diagnosis and treatment of catarrhal endometritis. cited by Dawson (1960).
- Rattensten, K. and Kierkegaard, S. (1954): Prevention and treatment of bovine endometritis. Agr. Coll. Infert. Rec., 11; 274.
- Richter, J. (1926): Die Sterilitat des Rindes. Berlin. Cited by Zaki et al. (1963).
- Riedel, L. (1935): Microbenflora bei Kuhen. Wein. Tierarztl. Mschr., 3: 121.
- Roberts, S.J. (1956): Veterinary Obstetrics and Genital disease. Ithaca, New York, published by the author.
- Seeleman, M. (1954): Biologie der Streptokokken. Verlag Hans Carl, Nurnberg.
- Sharaf, A.A.; Zaki, K. and Saber, M.S. (1963): The effect of oestrogen and progesterone on the growth of the normal bacterial flora of the external os uteri in Egyptian cattle. J. Arab. Vet. Med. Ass., 23 : 214.
- Williams, W. (1951): Veterinary Obstetrics. Ithaca, New York.
- Wilsons, G.S. and Miles, A.A. (1964): Topley and Wilson's principles of bacteriology and immunity. 5th Ed., Edwards Arnold publ. Ltd. London.
- Zaki, K.; Saber M.S.; Fouad, M.S. and El-Wishy, A. (1963): Treatment of chronic catarrhal endometritis in Friesion cows by Lugol's sodiome. Proc. 4th. Arab Ann. Vet. cong., Cairo, 349.
- Zaki, K.; Soliman, F.A. and Ramsees, G. (1963): The reproductive pattern of the Egyptian buffaloe. J. Arab Vet. Med. Ass., 23, 361.

Zaki, K.; Saber M.S.; Fouad, M.S. and El-Wishy, A. (1963): Treatment of chronic catarrhal endometritis in Friesion cows by Lugol's sodiome. Proc. 4th. Arab Ann. Vet. Cong., Cairo, 349.

Zaki, K.; Soliman, F.A. and Ramsees, G. (1963): The reproductive pattern of the Egyptian buffaloe. J. Arab Vet. Med. Ass., 23, 361.

TREATMENT OF CHRONIC ENDOMETRITIS

- 277 -

Table 2: Correlation between the bacterial flora isolated from chronic endometritis in cows before and after application of Lugol's.

Species of Organisms	1 st isolation		2 nd isolation		3 rd isolation	
	No	%	No.	%	No.	%
<u>Micrococcus species</u>	22	18.4	14	11.8	4	3.3
Staph.aureus	8	6.7	5	4.2	3	2.5
Staph.epidermidis	6	5.0	4	3.2	1	0.8
Sarcina lutea	5	4.2	4	3.4	--	---
Gaffkya tetragena	2	1.7	1	0.8	--	---
M.flava	1	0.8	--	---	--	---
<u>Streptococcus species</u>	25	21.1	16	13.4	7	5.8
Str.pyogenes	10	8.4	8	6.7	5	4.2
Str.bovis	5	4.2	4	3.4	1	0.8
Str.unclassified	4	3.4	1	0.8	--	---
Str.faecalis	2	1.7	--	---	--	---
Str.alpha-haemolytic	4	3.4	3	2.5	1	0.8
<u>Corynebacterium species</u>	15	12.6	10	8.4	5	4.1
C.pyogenes(typical)	4	3.4	2	1.7	1	0.8
C.pyogenes(atypical)	2	1.7	1	0.8	1	0.8
C.ovis	4	3.4	2	1.7	2	1.7
C.bovis	3	2.5	3	2.5	1	0.8
C.equi	1	0.8	--	---	--	---
C.unclassified	1	0.8	2	1.7	--	---
<u>Gram-negative bacilli</u>	25	21.1	17	14.4	10	8.5
E.coli	7	6.0	5	4.2	3	2.5
K.genitalium	2	1.7	1	0.8	--	---
Pr.vulgaris	3	2.5	3	2.5	--	---
Pr.mirabilis	2	1.7	--	---	--	---
Ps.aeruginosa	11	9.2	8	6.9	7	6.0
<u>Anthracooides species</u>	22	18.4	11	9.2	3	2.5
<u>Moulds</u>	4	3.4	1	0.8	1	0.8
<u>Yeasts</u>	6	5.0	5	4.2	--	---
Total	119	100.0	74	62.2	30	25.0

Table 3: Correlation between the bacterial flora isolated from chronic endometritis in buffaloes before and after application of Lugol's iodine.

Species of Organisms	I <u>st</u> Isolation		2 <u>nd</u> Isolation		3 <u>rd</u> Isolation	
	No	%	No.	%	No.	%
<u>Micrococcus Species</u>	26	17.2	18	12.0	7	4.7
Staph.aureus	13	8.6	11	7.3	6	4.0
Staph.epidermidis	2	1.3	2	1.3	--	---
Sarcina lutea	4	2.6	3	2.0	--	---
M.luteus	2	1.3	--	---	--	---
M.caseolyticus	1	0.7	--	---	--	---
M.flava	1	0.7	1	0.7	1	0.7
Gaffkya tetragena	3	2.0	1	0.7	--	---
<u>Streptococcus Species</u>	31	20.5	23	15.3	16	10.7
Str.pyogenes	9	5.9	4	2.6	4	2.6
Str.zymogenes	9	5.9	6	4.0	5	3.4
Str.durans	2	1.3	2	1.3	1	0.7
Str.unclassified	5	3.4	3	2.0	2	1.3
Str.bovis	3	2.0	3	2.0	3	2.0
Str.alpha-haemolytic	3	2.0	5	3.4	1	0.7
<u>Corynebacterium Spp.</u>	24	15.9	15	10.0	7	4.6
C.pyogenes(typical)	11	7.3	7	4.6	2	1.3
C.pyogenes(atypical)	2	1.3	-	---	--	---
C.ovis	7	4.5	5	3.4	--	---
C.bovis	2	1.3	--	---	--	---
C.equi	1	0.7	1	0.7	2	1.3
C.unclassified	1	0.7	22	1.3	3	2.0
<u>Gram-negative bacilli</u>	27	17.8	15	10.1	13	8.7
E.coli	6	4.0	5	3.4	3	2.0
K.genitalium	4	2.6	4	2.6	4	2.6
Pr.vulgaris	4	2.6	--	---	1	0.7
Pr.mirabilliis	4	2.6	--	---	--	---
Pr.morganii	3	2.0	1	0.7	--	---
Ps.aeruginosa	6	4.0	5	3.4	5	3.4
<u>Anthracooides Spp.</u>	19	12.7	10	6.8	5	3.4
<u>Yeasts</u>	13	8.7	9	5.9	6	4.0
<u>Moulds</u>	11	7.2	6	4.0	2	1.3
Total	151	100.0	96	64.1	56	37.4

TREATMENT OF CHRONIC ENDOMETRITIS

- 279 -

Table 4: Correlation between the general health condition of the affected bovin and the conception rate in accordance with the different concentrations of Lugol's solution.

Animal Species	General health condition	No. of Anim. Exam.	No. of Animals treated with Lugol's					
			Stock solution			Diluted (1:1)		
			Concep.	Fail.	Concep. rate	Concep.	Fail.	Concep. rate
Cows	Good	9	5	-	100%	4	-	100%
	Moderate	10	4	1	80%	2	3	40%
	Poor	15	-	8	--	-	7	--
	Total	34	9	9	50%	6	10	37%
Buffaloes	Good	15	8	--	100%	7	--	100%
	Moderate	6	2	1	66%	-	3	--
	Poor	18	1	8	11%	-	9	--
	Total	39	11	9	55%	7	12	37%

Exam. = Examined. Concep.= Conceived or Conception, Fail. = Failed.

Table 5: Correlation between the various degrees of inflammation with the conception rate after medication with Lugol's solution.

Animal Species	Degree of Inflammation.	No. of Anim. Exam.	No. of treated animals with Lugol's					
			Stock solution			Diluted slution		
			Concep.	Fail.	Concep. rate	Concep.	Fail.	Concep. rate
Cows	First	8	4	-	100%	3	1	75%
	Second	12	3	3	50%	2	4	33%
	Third	14	2	6	25%	1	5	17%
	Total	34	9	9	50%	6	10	37%
Buffaloes	First	9	5	-	100%	4	-	100%
	Second	14	4	3	60%	3	4	45%
	Third	16	2	6	25%	-	8	--
	Total	39	11	9	55%	7	12	37%