WEILS DISEASE
(LEPTOSPIROSIS)

A CONTAGIOUS DISEASE OF ANIMALS, OCCASIONALLY COMMUNICABLE TO MAN, CAUSED BY A PATHOGENIC SPIROCHETE OF THE GENUS LEPTOSPIRA.

THE RESERVOIR OF LEPTOSPIRES INCLUDES RODENTS AND CERTAIN DOMESTIC ANIMALS, THESE ANIMALS EXCRETE LIVE FULLY VIRULENT ORGANISMS IN THEIR URINE AND CONTAMINATE THE ENVIRONMENT OUTSIDE THE ANIMALS BODY.

LEPTOSPIRES CAN LIVE FOR SEVERAL WEEKS IN FRESH WATER. THUS INFECTION TAKES PLACE BY DIRECT CONTACT WITH URINE OF INFECTED ANIMALS OR BY INDIRECT CONTACT WITH CONTAMINATED FOOD OR WATER.

LEPTOSPIRES CAN READILY PENETRATE MUCOUS MEMBRANES BUT PROBABLY CANNOT GAIN ENTRANCE TO THE BODY THROUGH INTACT SKIN.

A SCRATCH OR ABRASION, AS WELL AS THE NASAL MUCOSA AND EYES, ARE EXCELLENT PORTALS OF ENTRY.

THE ORIGIN OF MANY INFECTIONS CAN BE TRACED TO WADING, SWIMMING OR OTHER CONTACT WITH WATER CONTAINING VIRULENT LEPTOSPIRES.

THE INCIDENT IN MAN DEPENDS UPON THE OPPORTUNITY FOR EXPOSURE I.E. PEOPLE WHO WORK IN SEWERS, OR UNDERGROUND CABLES AND MANHOLES, SWIMMING, HARVESTING AND CONTACT WITH ANIMALS

CLINICAL EVIDENCE OF THE DISEASE IN MAN VARIES DEPENDING UPON THE INFECTING TYPE OF LEPTOSPIRA. USUALLY AFTER AN INCUBATION PERIOD OF ABOUT A WEEK, FEVER, WEAKNESS AND PAINS IN THE LEGS, BACK AND ABDOMINAL MUSCLES ARE NOTED.

NAUSEA, VOMITING AND DIARRHOEA ARE NOT UNCOMMON.

ONE CHARACTERISTIC SYMPTOM IS CONGESTION OF THE CONJUNCTIVAL BLOOD VESSELS AROUND THE CORNEAS OF THE EYES. JAUNDICE MAY OCCUR AFTER THE FIRST WEEK OF ILLNESS.

THE DEATH RATE IS APPROXIMATELY 30% OF THE SEVERELY ILL AND JAUNDICED PATIENT.

PROTECT WORKING AREAS AGAINST WEILS DISEASE (LEPTOSPIRA ICTEROHAEMORRHAGIAE) BY SPRAYING WITH VIRID-DC.

VIRID-DC IS EFFECTIVE IN DESTROYING AND CONTROLLING WEILS DISEASE.

VIRID-DC AT A CONCENTRATION OF 1:50 15 ANTI-LEPTOSPRIAL AFTER 5 MINUTES EXPOSURE EVEN WHEN LARGE NUMBERS OF LEPTOSPIRES ARE PRESENT.

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ASSESSMENT OF ANTI-LEPTOPIRAL ACTIVITY OF VIRID-DC

Method

Preparation of inoculum

7 day culture of Leptospira interrogans serovar ICTEROHAEMORRHAGIAE icterohaemorrhagiae Ictero I. grown in Johnson and Harris' modification of Ellinghauson and McCullough medium at 30°C.

Four fold dilutions of leptospira culture, initial concentration 10^8 leptospires/ml. were made in PBS.
Three master dilutions were used in this study. 10^8. 10^4 and 10^2 leptospires/ml.

Preparation of detergent

Dilutions of detergent were prepared in distilled water at the following concentrations:

Neat. 1:50, 1:100 and 1:200

Assessment of anti-leptospiral activity

Culture

100ul volumes of detergent and inoculum were mixed in a sterile tube and 10 ul volumes of the mixture removed at the following time intervals. 0,5, 10 and 20 minutes. The roactant mixtures were then inoculated into 4 ml volumes of EMJH containing 2% rabbit serum and 0.1% agar and incubated at 30°C for 6 weeks. The cultures were examined at weekly intervals for evidence of leptospiral growth. A control for each concentration of inoculum was included comprising of leptospiral culture without disinfectant.

Mortality

An initial assessment of antileptospiral activity was also undertaken by placing 5 ul volumes of the reactant mixture into a Thomas counting chamber at the same time intervals as above and observing for loss of motility. The percentage loss of motility was determined by counting 100 leptospires and estimating the number of non-motile organisms under dark ground illumination at a final magnification of x 125.

These investigations were only carried out on reactant mixtures containing an initial leptospiral concentration of 10 3 organisms/ml because at leptospiral concentrations of 10^4 and 10^2 organisms/ml, there were too few leptospires visible to give an accurate estimate

RESULTS

Percentage motility

Initial concentration of disinfectant

Time (mins)	Neat	1:50	1:100	1:200
0	5	80	100	100
5	5	10	10	8
10	1	5	7	7
20	1	1	1	1

Concentration of leptospires = 10^8 organisms/ml. Above figures represent percentage of organisms still motile.

Culture results for initial inoculum of 10^8 leptospires/ml

Initial concentration of disinfectant

Time	Neat	1:50	1:100	1:200
0	NG	G	G	G
5	NG	NG	NG	G
10	NG	NG	NG	NG
20	NG	NG	NG	NG

G = growth of leptospires
NG = No growth

Culture results for initial inoculum of 10^4 leptospires/ml

Initial concentration of disinfectant

Time	Neat	1:50	1:100	1:200
0	NG	NG	NG	NG
5	NG	NG	NG	NG
10	NG	NG	NG	NG
20	NG	NG	NG	NG

Culture results for initial inoculum of 102 leptospires/ml
Initial concentration of disinfectant

Time	Neat	1:50	1:100	1:200
0	NG	NG	NG	NG
5	NG	NG	NG	NG
10	NG	NG	NG	NG
20	NG	NG	NG	NG

The three control cultures of 10^8 , 10^4 and 10_2 leptospires/ml without disinfectant all grew.

Conclusions

Virid-DC was totally anti-leptospiral when used neat against all dilutions of L.interrogans serovar Icterohaemorrhagiae. At concentration of 1:50 and 1:100 it was anti leptospiral after 5 minutes exposure even when large numbers of leptospires (10^8) were present.

Dr IR Ferguson
Director

PHLS SOUTH WEST

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Ms Lynne Ratcliffe,
Technical Support Manager,
NCH (UK) Ltd,
Lanchard House,
Victoria Street,
West Bromwich, B70 8ER

Dear Ms Ratcliffe,

Laboratory number: L98/2840

The Healthy Hands hand cleanser was tested for leptospiral activity by the method described in the protocol of 31.01.98.

The product was used as supplied.

Results for the product after six weeks incubation:

Tested against *Leptospira interrogans* serovar *Icterohaemorrhagiae RGA*.

Minutes	**Inoculum**		
	10^8	10^4	10^2 orgs/ml
0	NLG	NLG	NLG
5	NLG	NLG	NLG
10	NLG	NLG	NLG
20	NLG	NLG	NLG
Control : RGA	LG	LG	LG

NLG : No leptospiral growth LG: Leptospiral growth

Comment

Results suggest that Healthy Hands hand cleanser, will kill leptospires on exposure.

Should you wish to discuss these results further, please contact me.

Yours sincerely,

T. J. Coleman

Dr T J Coleman
Head of Unit