

Cairo University
Faculty of Veterinary Medicine
Department of Microbiology

Name : Ahmed Osman Ahmed Osman

Nationality : Egyptian .

Birth date : 8/12/1959

Degree : Doctor of Philosophy In Veterinary Medical Science (Bacteriology, Immunology and Mycology)

Title of thesis : The role of *Yersinia enterocolitica* in enteric diseases of cattle, sheep and goats

Supervisors :

Prof. Dr. Ahmed Farid

Professor Emeritus of Microbiology, Department of Microbiology, Faculty of Veterinary Medicine, Cairo University

Dr. Adel Ibrahim Tanios

Senior Researcher of Microbiology, Serology unit, Animal Health Research Institute, Dokki, Giza

Abstract

The role of *Y. enterocolitica* in enteric diseases for cattle, sheep and goats was studied. *Y. enterocolitica* was isolated 8% from buffaloes, 2% from cows, 1.5% from sheep and goats each. The isolated 24 isolates were related to sero/biovar O:3/2 and 2 were related to sero/biovar O:9/1. *Y. enterocolitica* O:3 was the most predominant in different animal species. The isolated *Y. enterocolitica* were tested to heat stable enterotoxin, guinea pig conjunctivitis and Congo red tests. *Y. enterocolitica* was experimentally infected in mice and it was found that the percentage of illness and deaths were increased with the increase of the dose of the given micro-organisms. The symptoms were emaciation , weakness and diarrhoea . Postmortem lesions were enlargement of stomach , swelling of small intestine , pneumonia, liver necrosis, congestion and enlargement of spleen and urinary tract affection . *Y. enterocolitica* was experimentally injected in goats, vaccination of goat with killed vaccine gave good level of protection against *Y. enterocolitica* infection. Serological tests revealed obvious cross reaction between *B. abortus* and *Y. enterocolitica* O:9 . Antibigram of isolated *Y. enterocolitica* revealed no variation between *Y. enterocolitica* O:3 and O:9 in sensitivity to the used antimicrobial agents. The isolated strains were sensitive to all antimicrobial agents used in this study , except ampicillin was resistance and Nalidix acid was moderate in sensitivity in vitro to *Y. enterocolitica* .

جامعة القاهرة
كلية الطب البيطري
قسم الميكروبيولوجي

الاسم : أحمد عثمان أحمد عثمان

الجنسية: مصري

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السادة المشرفين:

- ١- أ.د. أحمد فريد الميكروبيولوجي الطب البيطري القاهرة
٢- د. عادل إبراهيم طانيوس وحدة السيروولوجي معهد بحوث صحة الحيوان - الدقى

المستخلص

تم دراسة الدور التي تلعبه اليرسينيا المعوية القولونية في الأمراض المعوية للماشية والأغنام والماعز وتم عزل اليرسينيا المعوية القولونية ٨ % من الجاموس و ٢ % من الأبقار و ١,٥ % من الأغنام والماعز . تم تصنيف عترات اليرسينيا المعوية القولونية المعزولة من الحيوانات الى ٢٤ عترة نوع ٣ نمط ٢ وعدد ٢ عترة نوع ٩ نمط ١. وجد ان اليرسينيا المعوية القولونية ٣ هي السائدة في مختلف أنواع الحيوانات . تم إجراء اختبار أفراس السموم المعوية واختبار التهاب قرنية عين الخنزير الغنى واختبار الكونجو . تم إحداث عدوى تجريبية للفئران باليرسينيا المعوية القولونية وأوضحت الدراسة ان نسبة النفوق تتوقف على الجرعة المعطاة وطريقة الحقن وكانت الأعراض الظاهرية تتمثل في الهزال والضعف والسعال وأوضحت الصفة التشريحية تضخم في المعدة والأمعاء والتهابات رئوية وتتركز بالكبد واحتقان وتضخم بالطحال والتهابات بالمثانة البولية . تم إحداث عدوى تجريبية لماعز ووجد أن تحصين الماعز باللقاح الميت للنوع ٣ أو ٩ أعطى حماية جيدة ضد العدوى بميكروب اليرسينيا المعوية القولونية كم تم إجراء اختبارات سيروولوجية للماعز المصابة والمحصنة باليرسينيا المعوية القولونية وأظهرت النتائج تداخلا بين ميكروبي البروسيلا واليرسينيا المعوية القولونية نوع ٩. وأوضحت الدراسة أنه لا يوجد فرق معنوي بين اليرسينيا المعوية القولونية النوع ٣ والنوع ٩ للحساسية ضد المضادات الحيوية ومركبات السلفا . وأن العترات المعزولة ذات حساسية لكل المضادات الحيوية المستخدمة في الدراسة فيما عدا الأمبسلين فإنه مقاوم و كان حمض الناليدكسيد متوسط الحساسية .

LIST OF CONTENTS

	Page
1. Introduction.....	1
2. Review of literature	4
2.1 The genus <i>Yersinia</i>	4
2.2 General characters.....	4
2.2.1 Morphology.....	4
2.2.2 Culture character and motility.....	4
2.3 Growth requirements and effect of environmental factors.....	5
2.3.1 Nutritional requirements	5
2.3.2 Hydrogen ion concentration (pH):.....	5
2.3.3 Temperature.....	5
2.3.4 Seasonal prevalence:.....	6
2.4 Isolation and identification of <i>Yersinia enterocolitica</i>	6
2.4.1 Growth on routine isolation media:.....	7
2.4.2 Growth on selective media.....	7
2.5 Cold enrichment technique:.....	10
2.6 Biochemical identification.....	11
2.6.1 Conventional biochemical test.....	11
2.6.2 Analytical Profile Index (API system):.....	13
2.7 Serotyping	15
2.8 Epidemiology.....	19
2.8.1 Isolation from cattle.....	19
2.8.2 Isolation from sheep and Goats.....	22
2.8.3 Isolation from human.....	24
2.8.4 Animal reservoirs.....	27
2.9 Experimental infection	28
2.10 Pathogenicity.....	31
2.11 Virulence	34
2.12 Vaccination and Immunity	38
2.13 Antibigram.....	42
2.14 Serological cross-reaction.....	45
3. Material and Methods	49
3.1 Material.....	49
3.1.1 Samples	49
3.1.2 Media used for isolation of <i>Y. enterocolitica</i>	50
3.1.3 Media for identification of <i>Y. enterocolitica</i>	51

LIST OF CONTENTS

	Page
3.1.4 API 20E.....	53
3.1.5 Media for virulence tests.....	57
3.1.6 Media for experimental infection of goats.....	58
3.1.7 Media for antimicrobial susceptibility test.....	58
3.1.8 Reagents and chemical	58
3.1.9 Laboratory animals	60
3.1.10 Farm animals (goat)	60
3.1.11 Diagnostic antisera.....	61
3.1.12 Reference strains of <i>Y. enterocolitica</i>	61
3.1.13 For serological investigation of experimental infected and vaccinated goats with <i>Y. enterocolitica</i> O:3 and O:9	61
3.1.13.1 For Screening for <i>Brucella abortus</i> agglutinin.	61
3.1.13.2 For Screening for <i>Y. enterocolitica</i> antibodies	62
3.1.14. <i>Y. enterocolitica</i> O:3 and O:9 killed vaccine.....	63
3.1.15 Antimicrobial susceptibility disks.....	63
3.2 Methods	64
3.2.1 Sampling protocols	64
3.2.1.1 Faecal samples.....	64
3.2.1.2 Blood samples.....	64
3.2.2 Isolation of <i>Y. enterocolitica</i>	64
3.2.2.1 Direct plating.....	64
3.2.2.2 Cold enrichment	65
3.2.3 Identification of <i>Yersinia enterocolitica</i> isolates.....	65
3.2.3.1 Morphological examination	65
3.2.3.2 Cultural examination	66
3.2.3.3 primary biochemical screening tests	66
3.2.3.4 Further biochemical tests	67
3.2.4 Biotyping of isolates	71
3.2.5 Serotyping of isolates	71
3.2.6 Effectiveness of API 20E for identification of isolates.....	71
3.2.7 Virulence test.....	74
3.2.7.1 Enterotoxin assay	74
3.2.7.2 Invasiveness assay	75
3.2.7.3 Detection of pathogenic <i>Y. enterocolitica</i> by using Congo Red Magnesium Oxalate agar medium.....	76

LIST OF CONTENTS

	Page
3.2.8 Experimental <i>Y. enterocolitica</i> infection in mice.....	77
3.2.9 Experimental challenge <i>Y. enterocolitica</i> O:3 and O:9 in mice	78
3.2.10 Experimental infection and vaccination of goats with <i>Y. enterocolitica</i> O:3 and O:9	79
3.2.10.1 Serological investigation of experimental infected and vaccinated goats with <i>Y. enterocolitica</i> O:3 and O:9.....	80
3.2.10.1.1 Screening for <i>B. abortus</i> agglutinins.....	80
3.2.10.1.2 Screening for <i>Y. enterocolitica</i> antibodies	82
3.2.11 Antimicrobial susceptibility test	83
4. Results.....	86
4.1. Results of isolation of <i>Y. enterocolitica</i>	86
4.2. Seasonal variation of <i>Y. enterocolitica</i> isolated from different animals species	87
4.3. Comparison between direct plating and cold enrichment techniques in isolation of <i>Y. enterocolitica</i>	88
4.4. Biochemical tests of <i>Y. enterocolitica</i> isolates	89
4.5. Biotyping of isolated <i>Y. enterocolitica</i>	90
4.6. Comparison between API 20E and conventional method for identification of <i>Y. enterocolitica</i> isolates	91
4.7. Serovars of isolated <i>Y. enterocolitica</i>	92
4.8. Virulence of <i>Y. enterocolitica</i> sero/biovars isolated from different animal species	94
4.9. Results of experimental infection of mice with <i>Y. enterocolitica</i> O:3 and O:9	95
4.9.1. Results of reisolation of <i>Y. enterocolitica</i> O:3 from dead mice infected with 2.2×10^9 <i>Y. enterocolitica</i> O:3 by oral and I.P routes	98
4.9.2. Results of reisolation of <i>Y. enterocolitica</i> O:9 from dead mice infected with 2.2×10^9 <i>Y. enterocolitica</i> O:9 by oral and I.P routes	101
4.9.3. Results of clinical and post-mortem examination of experimentally infected mice with <i>Y. enterocolitica</i> O:3 and/or O:9	104
4.10. Results of experimental challenge of mice with <i>Y. enterocolitica</i> O:3 and O:9	110

	Page
4.10.1. Comparison of mean bacterial count (Logarithmic number) in challenged and control mice with <i>Y. enterocolitica</i> O:3 and O:9	110
4.11. Results of experimental infection and vaccination of goats with <i>Yersinia enterocolitica</i> O:3 and O:9.....	114
4.11.1. Morbidity and mortality in experimentally infected and vaccinated goats with <i>Y. enterocolitica</i> O:3 and O:9.....	114
4.11.2. Results of reisolation of <i>Y. enterocolitica</i> O:3 and O:9 from experimentally infected and vaccinated goats	115
4.11.3. Results of serological tests for <i>Y. enterocolitica</i> in experimentally infected and vaccinated goats	116
4.11.3.1 Correlation between <i>B. abortus</i> and <i>Y. enterocolitica</i> O:9 antibodies.....	116
4.11.3.2 Comparison of O and OH <i>Y. enterocolitica</i> O:9 and O:3 titres using standard tube agglutination test (SAT)	117
4.12. Antibigram of isolated <i>Y. enterocolitica</i> O:3 and O:9 from animals	122
5. Discussion	125
6. Summary.....	145
7. References	150
8. Arabic summary	

LIST OF ABBREVIATION

ADH	: Arginine dihydrolase.
API	: Analytical profile index.
API 20E	: Analytical profile index 20 Examination
<i>B. abortus</i>	: <i>Brucella abortus</i> .
CAL	: Cellobiose-Arginine-Lysine agar.
CD4	: Antigen receptors on lymphocytes cells.
C.F.U	: Colony forming unit.
C.I.N	: Cefsulodin-Irgasan-Novobiocin.
CRMO ⁺	: Congo Red Magnesium oxalate positive.
CRMO ⁻	: Congo Red Magnesium oxalate negative.
DNA	: Deoxy ribonucleic acid.
D.W	: Distilled water.
<i>E. coli</i>	: <i>Escherichia coli</i> .
ELISA	: Enzyme linked immuno sorbent assay.
g.	: Gram.
GPC ⁺	: Guinea pig conjunctivitis positive.
GPC ⁻	: Guinea pig conjunctivitis negative.
h	: hour.
HA	: Haemagglutination.
H antigen	: Flagellar antigen.
H ₂ S	: Hydrogen sulphide.
IND	: Indole.
I.M	: Intramascular.
I.P	: Intraperitoneal.
I.U / ml	: International unit per milliliter.
I.V	: Intravenous.
Kb	: Kilo base.
KIA	: Kligler iron agar.
LDH	: Lysine decarboxylase.
LPS	: Lipopolysacharides.
ml	: Milliliter.
mm	: Millimeter.
Na HCO ₃	: Sodium hydrogen carbonate.

LIST OF ABBREVIATION

NSS	: Normal saline solution.
O antigen	: Somatic antigen.
O.F	: Oxidation fermentation.
ONPG	: Orthonitrophenyl Beta galactosidase.
pH	: Hydrogen ion concentration.
RBPT	: Rose Bengal plate test.
S 19	: Strain 19 of <i>Brucella abortus</i> .
SAT	: Standard tube agglutination test.
Spp.	: Species.
S.S	: Salmonella-Shigella.
SST	: Stool screening test.
ST	: Heat stable enterotoxin.
TSB	: Trypticase soy broth.
TSI	: Triple sugar iron agar.
URE	: Urease.
USDA	: United State Department of Agriculture.
WHO	: World Health Organization.
Xg	: Relative centrifugal force.
<i>Y. enterocolitica</i>	: <i>Yersinia enterocolitica</i> .
<i>Y. frederiksenii</i>	: <i>Yersinia frederiksenii</i> .
<i>Y. intermedia</i>	: <i>Yersinia intermedia</i> .
<i>Y. kristensenii</i>	: <i>Yersinia kristensenii</i> .
<i>Y. medium</i>	: <i>Yersinia medium</i> .
YO	: <i>Yersinia</i> somatic antigen
<i>Y. pseudotuberculosis</i>	: <i>Yersinia pseudotuberculosis</i>
Yst	<i>Yersinia</i> stable enterotoxin
