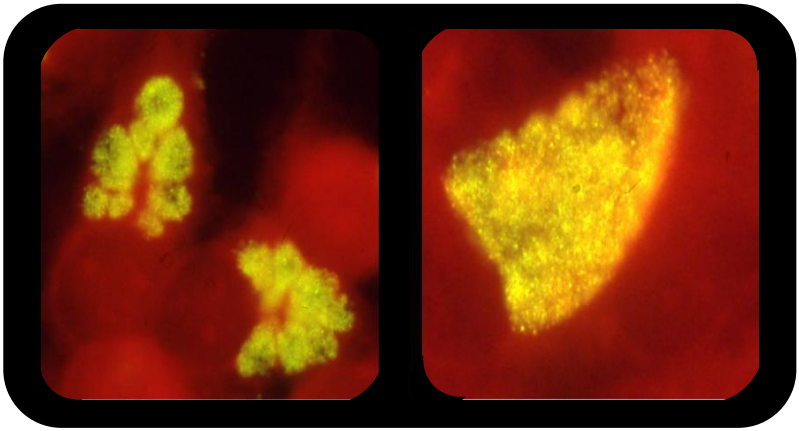
11th AACM

Eleventh Annual Amsterdam

Chlamydia Meeting



Hotel Mercure Amsterdam City

5 February 2016
9.00 – 17.00

Preface

Welcome: This year we organise the 11th Annual Amsterdam *Chlamydia* Meeting (11th AACM). As we introduced last year we have a Prize for the best oral presentation by a PhD student, and the quality of the oral presentations will be assessed by the Moderators of our sessions.

This year we have two outstanding keynote lectures by Prof Patrick Bavoil (USA) and Dr. Otilia Mardh (Sweden). As from the first AACM forward, we have many junior speakers including PhD students. We have this year for the first time pitches from students and beginning researchers and PhD students to pitch the work in which they are engaging for the upcoming years. This year we have 31 speakers from the Netherlands and abroad. We are confident that the speakers will spark the minds of both young as well as established Chlamydiologists and trigger valuable discussions this day!

The 14th German *Chlamydia* Workshop (GCW) which will be held from March 16-18th in Freiburg, Germany. Oral presenters of the AACM and GCW are given the opportunity to submit their work to a special *Chlamydia* issue in Pathogens and Disease (PaD) in 2016. Prof Patrik Bavoil is the Editor in Chief of Pathogens and Disease. The guest editors for this special issue in PaD are the organisers of the GCW and AACM, Prof. Georg Häcker and Prof. Servaas Morré. The best manuscripts of both meetings will be published in the PaD special issue. We would like to thank Patrick Bavoil for this unique opportunity!

Acknowledgements: We would like to thank our sponsors, without their support this meeting would not be possible in the current format: Roche, Mediphos and Hologic all present again with a stand and our other sponsors, NDBE, TubaScan and Diasorin. Finally, we would also like to thank those involved in the organization of this meeting from our Laboratory of Immunogenetics.

Dr. Servaas A. Morré
Head of the Laboratory of
Immunogenetics

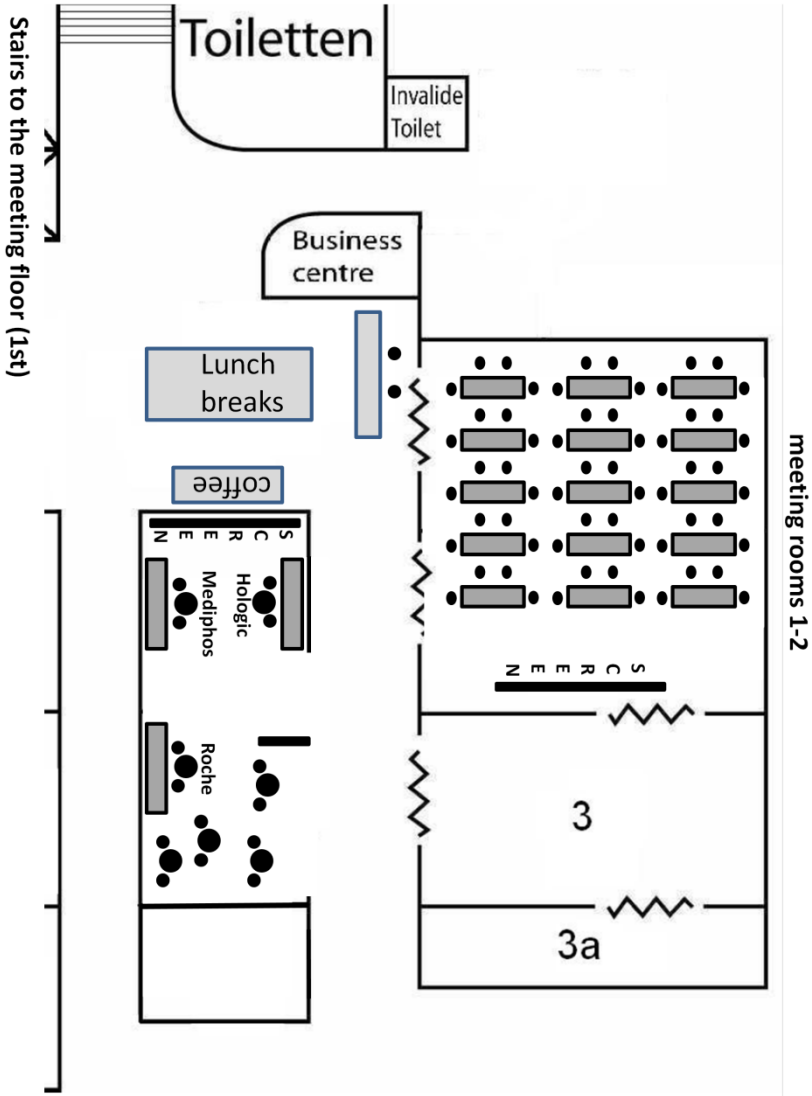
Dr. Sander Ouburg
Senior Postdoc
Infectious Diseases

Laboratory of Immunogenetics, Dept. Medical Microbiology and Infection Control, VUmc, Amsterdam, The Netherlands

Cover photographs: Immunofluorescence staining of *Chlamydia trachomatis* within epithelial cells. HeLa cells were infected with a clinical isolate and stained with a monoclonal antibody specific for the major outer membrane protein (OmpA) of *C. trachomatis*. The left panel shows a nonfusogenic phenotype, while the right panel shows a fusogenic phenotype. Images courtesy of Yvonne Pannekoek, Department of Medical Microbiology, Academic Medical Center, Amsterdam, The Netherlands.

Amsterdam, 5 February 2016

Floor plan (1st Floor, room 3)


Stairs to the meeting floor (1st)
Toiletten
Invalide Toilet
Business centre
Lunch breaks
coffee
SCREEN
Hologic
Mediphos
Roche
meeting rooms 1-2
3
3a

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Programme

9.00 – 9.30 **Registration to the symposium (1st floor, Foyer outside Room 3)**

9.30 Prof. Servaas Morré (NL)
Opening of the symposium

9.35 Prof. Patrik Bavoil (US)
Pathogens and Disease thematic issue

Session: Keynote lectures & New grants
Moderator: Prof. Servaas Morré

9.38 Prof. Patrik Bavoil (US)
The Yin Yang of Chlamydial Biology

10.15 Dr. Ingrid van den Broek (NL)
The Netherlands Chlamydia Cohort Study (NECCST): assessing the risk of complications after Chlamydia infection in women

10.30 Drs. Lisanne Eppings (NL)
FemCure

10.45 Prof. Servaas Morré (NL)
Eurostars TubaTest

11.00 – 11.20 **Coffee Break (In front of the meeting room)**

Session: Urogenital microbiome
Moderator: Prof. Henry de Vries

11.20 Dr. Jeanne Tamarelle (FR)
Vaginal microbiota composition and association with Chlamydia trachomatis infection among young women attending a STI clinic in France

11.35 Drs. Rivka Koedooder (NL)
ReceptIVFity

11.50 Drs. Charlotte van der Veer (NL)
Association between cervicovaginal microbiome and Chlamydia trachomatis infection: case-control study among chlamydia contact-traced women attending the sexually transmitted infections clinic in Amsterdam, the Netherlands

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Programme

Session: Pitches
Moderator: Prof. Servaas Morré

12.05 Drs. Daphne van Wees (NL)
Psychology and sexual behaviour in Chlamydia (re) infections

12.09 Drs. Kevin Janssen (NL)
Chlamydia trachomatis viability: the missing link in exploring implications of clinical testing

12.13 Jelmer Jukema (NL)
Rare genetic variants and female infertility

12.17 Drs. Martin Singer (NL)
Rab GTPases and the Chlamydia inclusion

12.21 Dr. Ivan Branković (NL)
Functional analysis of host genetic biomarkers for improving female subfertility diagnosis

12.25 Drs. Bob Sukel (NL)
The STI-Self testing market in The Netherlands

12.30 – 13.10 **Lunch (In font of the meeting room)**

Session: *Chlamydial trachomatis* infections in and out of Europe
Moderator: Prof. Henry de Vries

13.10 Dr. Otilia Mardh (SE)
ECDC Chlamydia control in Europe Guidance 2016 – moving chlamydia prevention and control forward

13.30 Drs. Jan Henk Dubbink (NL)
Treatment of sexually transmitted infections using vaginal discharge syndromic management guidelines in South African women

13.45 Drs. Menne Bartelsman (NL)
Leucocyte Esterase Test as a point-of-care test diagnostic for urogenital chlamydia in male patients. A multi centered evaluation in two STI outpatient clinics in Paramaribo and Amsterdam

Programme

14.00 Drs. Pierre Thomas (NL / FR)
Review on Chlamydia trachomatis in India

14.15 Drs. Vitaly Smelov (RU)
Chlamydia trachomatis in Russia: what's known so far

Session: *Chlamydia trachomatis* Epidemiology, Detection, and Control
Moderator: Prof. Christian Hoebe

14.30 Dr. Nicole Dukers (NL)
Peer driven interventions for chlamydia testing

14.45 Dr. Geneviève van Liere (NL)
What is needed to guide extra-genital testing?

15.00 Dr. Janneke Heijne (NL)
What explains anorectal chlamydia detection in women: implications for control strategies?

15.15 Drs. Esmée Lanjouw (NL)
The 2015 IUSTI Chlamydia guidelines

15.30 – 15.50 **Coffee break (In front of the meeting room)**

15.50 Drs. Caroline Wind (NL)
Time to clearance of Chlamydia trachomatis RNA and DNA after treatment in patients co-infected with Neisseria gonorrhoeae – a prospective cohort study

16.05 Drs. Bart Versteeg (NL)
Development of a human urethral equivalent to study Chlamydia trachomatis invasion

Session: Non-CT and LGV infections
Moderator: Dr. Yvonne Pannekoek

16.20 Dr. Yvonne Pannekoek (NL)
Typing of members of Chlamydia with zoonotic potential

16:35 Drs. Marloes Heijne (NL)
Plat4m-2Bt-Psittacosis

16.40 Drs. Cindy de Boeck (BE)
Chlamydia psittaci vaccination on a chicken broiler farm: a pilot experiment

Programme

16.55 Drs. Nynke de Vrieze (NL)
Prevalence of urethral lymphogranuloma venereum infections among MSM

Session: Serology
Moderator: Prof. Christian Hoebe

17.10 Drs. Bernice Hoenderboom (NL)
Development and validation of self-collection methods of whole blood for Chlamydia trachomatis antibody detection

17.14 Drs. Eleanne van Ess (NL)
Improving diagnostics in subfertile women by developing a more sensitive and specific C. trachomatis serology test

17.18 Dr. Marleen Jansen (NL)
Serological thresholds in infertility diagnosis

17.35 Moderators meet to select the best oral presentation by a PhD student

17.40 Best presentation by a PhD student prize

Closing remarks: Prof. Servaas Morré

17:45 - 18:30 Drinks with "bitterballen" (Foyer, lobby level)

18:30 Diner (Restaurant Mercure Amsterdam City)

Notes

Amsterdam, 5 February 2016

In Memoriam

Han Fennema

1955 – 2016

Op 8 januari overleed Han Fennema, medisch directeur GGD Amsterdam. Sinds de constatering van zijn ziekte zo'n vier jaar geleden bleef hij zich zoveel als mogelijk inzetten voor de GGD. Na zijn studie geneeskunde in Amsterdam werkte Fennema enkele jaren voor Artsen zonder Grenzen in Colombia. In 1988 kwam hij als junior dokter bij de GGD in Amsterdam. Daar kwam hij onder de vleugels van Roel Coutinho, die er destijds hoofd was van de afdeling Volksgezondheid. Han Fennema werkte op de Soa-poli en bekommerde zich vooral om het lot van heroïne prostituees. Han Fennema was zeer begaan met deze trieste en kwetsbare groep vrouwen. Toen hij hogerop in de organisatie kwam, zei hij geregeld dat hij het patiëntencontact enorm miste.
Een volgende stap in zijn dertigjarige carrière bij de GGD zette Fennema toen hij aan Coutinho te kennen gaf onderzoek te willen gaan doen. Of dat wel een goed idee was voor zo'n man van de praktijk werd enigszins betwijfeld, maar Fennema zette door. Hij verdiepte zich in statische gegevens met betrekking tot epidemiologie en in 1997 promoveerde hij met een zeer gedegen proefschrift over de relatie tussen hiv en andere seksueel overdraagbare aandoeningen. Kenmerkend voor Han was dat als hij ervan overtuigd was, hij er helemaal voor ging.
Fennema zette zich met diezelfde gedrevenheid in bij de bestrijding van hiv. Hij was een van de drijvende krachten achter het Chlamydia Screenings Initiative (CSI), een landelijk project waarbij jongeren zich gratis op chlamydia konden laten testen en als laatst het AMPrEP project met preventieve hiv-remmers.

In 2000 werd Fennema hoofd van de Soa-poli in Amsterdam en in 2005 hoofd van het cluster infectieziekten. In 2010 werd hij medisch directeur van de GGD. In zijn leidinggevende rollen toonde Fennema zich sterk van buiten, maar zacht van binnen. Hij was prettig in de omgang, gedreven, scherp van geest, open en direct. Hij hield niet van dubbele agenda's, moest niets hebben van politiek gekonkel. Als hij het ergens niet mee eens was, liet hij dat horen. Hij was duidelijk, je wist waar je aan toe was. Maar als je hem kon overtuigen met goede argumenten stond hij daar ook voor open. Het ging hem altijd om de inhoud.

Han was ten voeten uit een man van de praktijk, die altijd de vertaling maakte van beleid naar praktijk en andersom. Verder was hij ook gewoon een hele aimabele en sociale collega.
Collegiaal was Fennema ook op sportief gebied. Hij was een van de vaste krachten in het bedrijfsvolleybalteam. Daarnaast was hij een enthousiast wielrenner, die meermaals de Alpe d'Huez bedwong.

Diezelfde hartstocht toonde de medisch-directeur ook voor muziek - 'hij was gek op Bach' - en voor beeldende kunst. Samen met zijn vrouw Suzan volgde hij een avondopleiding beeldende kunst aan de gerenommeerde Wackers Academie. Zij volgden ook graag creatieve workshops in Italië.

Ook toen er in 2011 kanker bij Han Fennema werd geconstateerd, bleef hij zich gedreven inzetten voor de GGD. Hij werkte vanuit huis en gaf per mail gevraagd en ongevraagd zijn input op diverse lopende zaken. Hij bleef tot het eind toe betrokken.
We zullen Han enorm missen. Zijn levenslust, kritische geest en doorzettingsvermogen zullen ons blijvend inspireren.

Amsterdam, 21 januari 2016,
Henry de Vries

Amsterdam, 5 February 2016

Prof. Patrik M. Bavoil, PhD

Department of Microbial Pathogenesis, University of Maryland, Baltimore, USA

pbavoil@umaryland.edu

Curriculum Vitae

Prof. Patrik M. Bavoil, PhD, has studied *Chlamydia* for over 35 years. After undergraduate studies in his native France, he earned his PhD in Microbiology in 1982 from the University of California (UC), Berkeley, under the guidance of Prof. Hiroshi Nikaido. From 1984 until 1987, he trained as a post-doctoral fellow under the mentorships of Profs. Julius Schachter at UC San Francisco and Stanley Falkow at Stanford University. Dr. Bavoil has held faculty positions at the University of Rochester, New York, and the London School of Hygiene and Tropical Medicine, United Kingdom. He currently is Professor and Chairman of the Department of Microbial Pathogenesis, University of Maryland, Baltimore, USA.

Dr. Bavoil's early contributions were investigations of the cysteine-rich protein OmcB's role in adherence, the stress response protein GroEL (Hsp60), and the major outer membrane protein's (MOMP) role as a porin and in the host response to infection in relationship to immunity. Dr. Bavoil and his collaborators, Drs. Byron Batteiger (Indiana University) and Roger Rank (U. Arkansas for Medical Sciences), were first to suggest that MOMP conformation should be preserved in any MOMP-based vaccine. In the late nineties, Dr. Bavoil and his close collaborator, Dr. Ru-ching Hsia (University of Maryland), and their collaborators made two important discoveries: the isolation of the second known chlamydiaphage and the identification of type III secretion (T3S) genes in *Chlamydia*. The latter instantly launched a major new area of *Chlamydia* research. In collaboration with biomathematician, Dr. David Wilson, Dr. Bavoil then developed the "T3S-Mediated Contact-Dependent Hypothesis of *Chlamydial* Development", which proposes that disruption of T3S activity through loss of contact between *chlamydiae* and the inclusion membrane, is associated with the onset of late differentiation, the key step that "arms" *chlamydiae* for subsequent infection. In the past decade, Drs. Hsia and Bavoil have led studies of the large family of autotransported polymorphic membrane proteins (Pmps) of *Chlamydia* spp. They demonstrated that *C. trachomatis*-infected patients elicit variable Pmp-specific antibody profiles, a phenomenon which is mirrored by the variable expression of these proteins in infected cultured cells. These findings have suggested that Pmp-specific antibodies may be useful biomarkers of susceptibility/resistance to *C. trachomatis* infection and of disease severity. With Dr. Jacques Ravel, Dr. Bavoil currently co-directs one of 5 NIH-funded Sexually Transmitted Infections Cooperative Research Center titled "Eco-Pathogenomics of Sexually Transmitted Infections" (EPSTI) that includes major collaborations with leading researchers at Duke University, Johns Hopkins University, University of Virginia and University of Idaho. EPSTI aims to identify microbial, genomic (host and pathogen), molecular and immune biomarkers of chlamydial and gonococcal infection and disease in infected patients and their partners. Other current research involves newly discovered T3S effectors of *C. psittaci* with unique properties.

Dr. Bavoil is a founding member and former president of the *Chlamydia* Basic Research Society (CBRS), the largest society in *Chlamydia* research, and is the current President-Elect of the Maryland Branch of the American Society for Microbiology. He played a leading role in the organization of the CBRS meetings held in Indianapolis in 2005 and Redondo Beach in 2011. Dr. Bavoil also has served as co-editor of several volumes of Methods in Enzymology with Dr. Virginia Clark (U Rochester) as well as two volumes on *Chlamydia*, respectively with Drs. Priscilla Wyrick (East Tennessee State U) and Ming Tan (UC Irvine). Since 2008, he is the Editor-in-Chief of the journal "Pathogens and Disease" of the Federation of European Microbiological Societies (FEMS). In 2015, Dr. Bavoil was elected a Fellow of the American Academy of Microbiology.

Abstract

In Chinese philosophy, Yin and Yang are two complementary principles that interact to maintain the harmony of the universe and influence everything within it. Many features of chlamydial biology are complementary principles that interact to maintain harmony with the host (or host cell) and influence everything within it. While Yin Yang is applicable to many traits of chlamydial biology at multiple levels, it also forms the basis of the "gut hypothesis" of chlamydial persistence, whereby all *Chlamydia* spp. have evolved primarily as commensals of the GI tract of their host primarily transmitted via the fecal-oral route, but readily become opportunistic pathogens when in a non-GI environment. A first correlate of the hypothesis is that, where applied, global sanitation/enhanced personal hygiene have nearly eliminated fecal-oral transmission of *chlamydiae*, and direct contact (e.g., sexual, fingers, flies) has become established as the primary route of transmission. A second correlate is that oral sexual practices that have risen in the past half-century have 'reintroduced' *C. trachomatis* in the human GI tract. From there, infectious *chlamydiae* may reach the rectum and contaminate the genital tract, which in women, raises the provocative question of whether orally inoculated chlamydiae cause or contribute to chronic infection of the genital tract and its sequelae: Pelvic Inflammatory Disease (PID), life-threatening ectopic pregnancy, and tubal factor infertility.

Our laboratory has addressed the Yin Yang of chlamydial biology on multiple fronts. With respect to *C. trachomatis* infection in humans, a large NIH-funded project involving ~50 researchers at several academic institutions, is investigating the triangular relationship between the infecting chlamydial genomotype, the composition and dynamics of the vaginal microbiota and the genetics of the host using a networked cohort of *C. trachomatis*-infected patients from the Baltimore area. Our ultimate aim is to identify predictive or diagnostic biomarkers of susceptibility vs. resistance to infection, asymptomatic vs. symptomatic infection, and mild vs. severe disease. On a molecular level, we are comparatively investigating orthologous virulence factors of different *Chlamydia* spp. that have distinct pathogenic properties (e.g., *C. trachomatis* and *C. psittaci*) in an attempt to elucidate differential developmental and pathogenic pathways in different species. This approach has led to the discovery of two novel type III secreted effectors of *C. psittaci* with unprecedented properties: the inclusion membrane protein IncA, which uniquely displays a BAR-like domain related to eukaryotic sorting nexins, and SinC, which targets LEM-domain proteins of the nuclear inner membrane of infected cells, and, remarkably, that of neigboring uninfected cells. We propose that these unique effectors are key factors in the pathogenic arsenal of *C. psittaci* and consequent disease severity.

Amsterdam, 5 February 2016

Ingrid van den Broek, PhD

Center for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands

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Curriculum Vitae

Ingrid van den Broek (1969) has worked as an epidemiologist at the Center for Infectious Disease Control of the RIVM since 2006. She worked on various research topics within the field of control and surveillance of STI's, mainly related to the epidemiology and risk groups for *Chlamydia*. She was involved in studies of the effect of population screening, connecting to the present research into the late complications of *Chlamydia*. She also has also done various studies on the role of the general practitioner in STI care in the Netherlands compared to other STI care providers.
Before 2006, her research focussed on malaria control and emergency health. She coordinated several studies on the effectiveness of antimalarial therapy and performed rapid health assessments in field projects of 'Medecins sans Frontières' in various tropical countries around the world. In 1999 she completed her PhD at the University of Groningen, in a more experimental biological setting (Dept. Animal Physiology), on the role of the olfactory system of the malaria mosquito *Anopheles gambiae*. She studied Biology in Utrecht (graduation in 1993).

Abstract

Chlamydia trachomatis (Ct) may lead to severe complications in women, such as: pelvic inflammatory disease (PID), prolonged time to pregnancy, ectopic pregnancy, and tubal infertility. Diverse transmission control strategies have not been successful in reducing Ct prevalence. It may be more effective to focus on prevention of complications after a Ct infection. Until now, the risk of complications following a Ct infection has not been assessed directly in a prospective cohort study; various (modelling) studies give a wide range of estimates; identification of factors that contribute to the development of complications will enable better targeting of treatment and prevention options.

NECCST will assess the risk and associated determinants of developing PID and related fertility complications, and time to pregnancy, in women with and without a history of *chlamydia*. Host genetic biomarkers and behavioural, demographic, and

pathogen factors potentially associated with the development of these complications will be investigated.

The design is a prospective cohort study, which is a continuation of the large scale Chlamydia Screening Implementation (CSI, between 2008 and 2011). In NECCST we will recruit all CSI women who consented to be approached for follow-up (2,371 CSI Ct positive women and 12,314 CSI Ct negative women), and prospectively follow them until 2022. Biological samples stored in a Biobank will be used to measure the presence of specific candidate host genetic biomarkers, i.e. Single Nucleotide Polymorphisms (SNPs), potentially associated with altered risk for complications following a Ct infection. During NECCST, four data collection rounds are foreseen, with online questionnaires at every round and self-collection of blood samples at the first and last round for measurement of Ct IgG antibodies, as a marker of a previous Ct infection.
The study will yield estimates of the incidence of sequelae of infection and assess differences between women with and without previous recorded chlamydia infections. The main endpoints are PID, ectopic pregnancy, tubal infertility and time to pregnancy. The main determinant is the presence of a previous Ct infection (laboratory-confirmed infection, self-reported or confirmed with IgG serology). Secondary determinants include candidate host genetic biomarkers and behavioural, demographic, and pathogen factors possibly associated with the development of Ct related complications. The first phase is a PhD project covering data collection until 2018; we hope to continue until 2022 to complete a 10-year follow-up for all participants.

NECCST has started to invite CSI women in October 2016; the first 1300 invitations have resulted in 600 respondents, who filled in the online questionnaire (46%). Of these, 230 respondents received a test kit for IgG analyses of whom 150 have now returned a self-collected blood sample. With an estimated participation rate of 50-60%, we will recruit a total of 7400 participants. We have estimated to come to a number of 180 cases of PID, 60 ectopic pregnancies and 23 cases of tubal infertility after the first phase of study.

Amsterdam, 5 February 2016

Lisanne Eppings, MSc

Department of Sexual Health, Infectious Diseases and Environmental Health, Public Health Service South Limburg. 2) School of Public Health and Primary Care (CAPHRI), Maastricht University Medical Center (MUMC+)

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Curriculum Vitae

Lisanne Eppings was born on October the 24th 1989. She received her BSc. degree in Physical Therapy at the Fontys University of Applied Sciences in Eindhoven, in 2011. After this she continued studying at the VU University in Amsterdam, where she received her MSc. degree in Health Sciences – Infectious Diseases, in 2014. She started working as a PhD-student at the Public Health Service (GGD) in South Limburg in May 2015 under supervision of Prof. Dr. CJPA Hoebe and Dr. NH Dukers-Muijrers in collaboration with the School of Public Health and Primary Care (CAPHRI) of the Maastricht University Medical Center (MUMC+). The focus of her PhD will be on the transmission and acquisition of *Chlamydia trachomatis*, which will be investigated with the FemCure study she is about to start in March 2016.

Abstract

Chlamydia trachomatis (CT) is the most common sexually transmitted infection worldwide. Dutch guidelines currently advice to abstain from (unprotected) sexual intercourse one week after treatment. Nevertheless, a good insight in the acquisition, transmission and treatment methods of CT remains understudied. The FemCure study aims to increase knowledge about these aspects.

FemCure will be a longitudinal cohort study following 400 CT positive women who visited the Public Health Service (GGD) of South-Limburg, Rotterdam or Amsterdam. After these women took the usual CT-treatment (azithromycin for genital CT and doxycycline for anal CT) they will be followed for another 3 months in which they take 12 extra anal and 12 extra vaginal swabs while reporting their sexual behavior. These swabs will be used to look at the bacterial load and viability and compared with the reported sexual behavior. All these variables will be used to compare the effectivity of both treatments. Ultimately new recommendations for the current treatment regime can be made.

Amsterdam, 5 February 2016

Prof. Servaas A. Morré, PhD

Laboratory of Immunogenetics, Dept. of Microbiology and Infection Control, VU University Medical Centre, Amsterdam, The Netherlands

samorretravel@yahoo.co.uk

Curriculum Vitae

Professor Servaas A. Morré, PhD has been working on infectious diseases for more than 20 years and he has over 175 publications, most of which are on *Chlamydia trachomatis*. He graduated at the VU University, The Netherlands, in Biochemistry and Molecular Biology in 1994 and is currently working as Head of the Laboratory of Immunogenetics, VU University medical center, Amsterdam and as Director of the Institute of Public Health Genomics, University of Maastricht. Since 1st of Sept 2009 the RIVM reference tasks concerning *Chlamydia trachomatis* diagnostics (Dutch CT Reference Laboratory) and CT research tasks were allocated to him at the VU University Medical Center and since 1st of January 2014 together with Prof.dr. Christian Hoebe. Intellectual Property has been obtained and linked to several VUmc Spin-in companies including Microbiome Ltd, (Co-Founder and Co-Director) which won the Amsterdam Inventor Award in 2008 and the FD Gazellen Award in December 2011 and 2012 and TubaScan Ltd (Founder & Director) a spin-in company focussing on medical diagnostics on the basis of host genetic markers amongst others for Periodontitis, Female subfertility and HLA typing.

Abstract

1. **Project title**

The development of an accurate host genetic diagnostic assay for women with subfertility.

2. **What do you want to do? What will you deliver?**

Almost 25% of women with *Chlamydia trachomatis* (CT)-associated subfertility are faced with sub-optimal treatments due to a lack of accurate diagnostic tools. Genetic studies have enabled the discovery of 50 single nucleotide polymorphisms (SNP) and their validation as subfertility biomarkers. TUBATEST has been designed to develop a diagnostic assay based on host genetic SNP profiling. TUBATEST will enable the accurate diagnosis of women with CT-associated subfertility thereby improving their health.

3. **Why do you want to do it?**

Each year, 310,000 women in Europe alone are faced with CT-associated subfertility. Once diagnosed with CT, they will need to undergo an invasive laparoscopy with a high risk of side effects. However, CT has a low predictive value which leads to many unnecessary laparoscopies while simultaneously undertreating other women. TUBATEST has developed state of the art SNP biomarkers to analyse the CT-associated subfertility in a non-invasive way thereby reducing treatment-related risks.

Amsterdam, 5 February 2016

Jeanne Tamarelle, BSc, BA, MPH

UMR 1181 "Biostatistics, Biomaths, Pharmacoepidemiology and Infectious diseases" (B2PHI). Institut Pasteur/Inserm/UVSQ, France

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Curriculum Vitae

Jeanne Tamarelle was born on September 27th 1990 in France. She followed a double degree in Science and Social Sciences at the University of Paris VI and at Sciences po Paris. She obtained an Advanced Vocational Certificate in Laboratory Methods, specializing in microbiology. She then graduated from a Master of Public Health, specializing in the epidemiology of Infectious Disease, at the Pasteur/CNAM School of Public Health in 2015. She is currently working as an epidemiologist in the UMR 1181 "Biostatistics, Biomaths, Pharmacoepidemiology and Infectious Diseases" at the Institute Pasteur and preparing a PhD thesis on the role of the vaginal microbiota in *Chlamydia trachomatis* infection, as part of the PID-Prev Trial.

Abstract

Introduction

Genital infection with *Chlamydia trachomatis* (Ct) is the most frequent bacterial sexually transmitted infection (STI), in particular among young women. Though mostly asymptomatic, this infection can evolve towards Pelvic Inflammatory Disease (PID), which in turn can lead to tubal factor infertility and ectopic pregnancy, if left untreated. In France, screening has been recommended for sexually active young women attending STI clinics since 2003. Recent data suggest that Ct infections are not yet controlled in France and Europe. Throughout the course of the natural history of Ct infection, many factors are thought to play a role in favoring or preventing Ct infection, persistence and evolution towards PID, among which the vaginal microbiota composition. New molecular techniques have permitted to describe groups of bacterial communities in the vagina (community state types (CST)). Here, we sought to characterize the vaginal microbiota of a sample of women attending a STI clinic in France and determine whether any particular CST was associated with a greater susceptibility to Ct infection.

Methods

The PID-Prev community trial aims at evaluating systematic screening and treatment for Ct infection as a mean to prevent PID in French female students and at studying natural history of Ct infection. As a preliminary study to the PID-

Prev trial, a cross sectional study on vaginal microbiota composition among 18-25 years old women attending a STI clinic was carried out in June 2015. Participants provided vaginal sample for routine Ct screening and sociodemographic data were collected. These samples were kept in an Aptima (Hologic©) medium allowing transportation at room temperature. Ct screening was carried out at the National Reference center using the Aptima-combo 2 Transcription-Mediated-Amplification assay. Vaginal microbiota composition was studied using high-throughput 16S RNA genome sequencing (University of Maryland). Statistical analysis was performed using Stata 12.0

Expected results and perspectives

One hundred and forty-four women were included in the study. Analysis will allow to characterize the vaginal microbiota of young women for the first time in France. Association between vaginal CST and Ct infection will be studied, controlling for sociodemographic factors such as age, origin, sexual orientation and motives for consultation. It will help us to generate hypothesis on the role of the vaginal microbiota on the natural history of Ct infection, which will be further investigated in the PID-Prev trial.

Amsterdam, 5 February 2016

Rivka Koedooder, MD

Division Reproductive Medicine, Department of Obstetrics & Gynaecology, Erasmus MC, Rotterdam, The Netherlands

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Curriculum Vitae

Rivka Koedooder is educated as a Medical Doctor at the Erasmus University Rotterdam. During her studies she became fascinated by the nature of reproduction in human life. After working for a year on the department of Gynaecology & Obstetrics she started in 2015 as PhD Candidate with the topic 'The urogenital microbiome as a predictor for IVF outcome' at ARTPred and Erasmus Medical Center. ARTPred is a biotech company that wants to add value to global fertility care by developing a minimal invasive predictive IVF test, that could save countless women the burden of unnecessary IVF treatment. Currently a national validation study is ongoing, titled 'ReceptIVFity-I'.

Abstract

In the Netherlands, each year between 16.000 and 18.000 IVF treatments take place. Only three out of ten attempts are successful after the first IVF cycle and result in pregnancy. Meanwhile, the burden is high for the women under treatment, both physically and emotionally.

This presentation aims a) to provide insight in the role of the microbiome in IVF outcome b) to elaborate on the future possibility of having a predictive test for IVF outcome.

Amsterdam, 5 February 2016

Charlotte van der Veer, BSc

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Curriculum Vitae

Charlotte van der Veer is currently employed as a PhD student at the Public Health Laboratory of the Municipal Health Service (GGD) Amsterdam, the Netherlands. Her PhD trajectory started in January 2014 and her thesis will focus on the composition of the vaginal microbiome and how it relates to acquiring sexually transmitted infections, in particular *Chlamydia trachomatis* and *Trichomonas vaginalis* infections. Furthermore, she is validating a molecular typing method for *Trichomonas vaginalis*. Before starting her PhD, she studied Bio-medical Sciences at the Vrije Universiteit in Amsterdam, where she received both her Bachelor's and Master's degree of science. Her interest in the molecular epidemiology of infectious diseases was sparked during her master internship at the Bio-medical research unit of the Royal Tropical Institute in Amsterdam, where she characterized the Leishmania parasite in patient samples from Suriname. She completed her primary and secondary education in Pretoria, South Africa.

Abstract

Background

Increasing evidence suggests that the cervico-vaginal microbiome (CVM) plays an important role in acquiring sexually transmitted infections (STIs). Here we study the CVM in a population of women notified by a sex-partner for *Chlamydia trachomatis* (Ct) infection.

Methods

We included 98 women who were notified by Ct positive sex partners via contact-tracing at the STI outpatient clinic in Amsterdam, the Netherlands, and analyzed their cervico-vaginal samples and clinical data. CVMs were characterized by sequencing of the V3/V4 region of the 16srRNA gene and hierarchically clustered. Determinants for acquiring Ct were analyzed using univariable and multivariable logistic regression.

Results

The CVM was characterized for 93 women, of whom 52 tested Ct positive and 41 Ct negative. We identified three major CVM clusters. These clusters either predominantly consisted of diverse anaerobic bacteria (n=39; 42%), *Lactobacillus iners* (n=32; 34%) or *Lactobacillus crispatus* (n=22; 24%). We found that the CVM significantly associated with Ct infection, where women with a diverse anaerobic

CVM or *L. iners*-dominated CVM were resepctively 4.2 (95% confidence interval: 1.2-15.4) and 4.4 (CI: 1.3-15.6) times more likely to test positive for Ct infection, compared to women with an *L. crispatus*-dominated CVM. Younger age (≤21 years old) and reporting a steady sex partner both increased the odds for Ct infection by a factor of respectively 3.1 (CI: 1.1-8.7) and 3.6 (CI: 1.4-9.4).

Conclusion

All women in this study were presumably exposed recently to Ct and those with CVMs dominated by *L. crispatus* were less likely to test positive for Ct.

Amsterdam, 5 February 2016

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Curriculum Vitae

Daphne van Wees (1991) studied Health Sciences (specialization Infectious Diseases and Public Health) at the VU University in Amsterdam, where she graduated in July 2015. She completed her master thesis about the incidence and seasonality of infectious diarrhoea and the influence of climate, economic wealth and sanitation practices at the Royal Tropical Institute (KIT) in Amsterdam. In September 2015 she started as a PhD student at the National Institute for Public Health and the Environment (RIVM).

PhD-project: Mathematical models incorporating Psychological determinants: control of Chlamydia Transmission (iMPaCT). Promotor: Prof. Dr. Mirjam Kretzschmar (RIVM, Julius Center), Co-promotors: Dr. Janneke Heijne (RIVM) and Dr. Chantal den Daas (RIVM).

Abstract

Background: Control of the curable STI *Chlamydia trachomatis* is proven to be challenging; a reason for this might be high re-infection rates after treatment. Therefore, behaviour change after a diagnosis might be vital to reduce re-infection rates. In addition, because most people are unaware of their infection, preventive health actions (such as using condoms) depend on psychological determinants.

Objective: To study the link between behavioural and psychological determinants and chlamydia (re-)infection, and to investigate if short-term (after diagnosis) and long-term (sexual careers) changes (or stability) in these determinants affect the probability of becoming re-infected.

Study design: A clinical study (longitudinal cohort study) will be conducted to collect data on sexual behaviour and psychological determinants from young heterosexual men and women visiting STI-clinics. To measure changes in these determinants, questionnaires are administrated at four time points: at baseline, 3 weeks, 6 months and at one year follow-up. Furthermore, to be able to link these determinants to (re-)infections, the participants will be tested for chlamydia at enrolment and at 6 months follow-up. Ultimately, the data collected in the clinical study will be used to parameterise a mathematical model, which will provide

valuable information for public health policy makers to guide which intervention measures should be prioritised and conducted in the future.

Amsterdam, 5 February 2016

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Curriculum Vitae

Kevin Janssen (1986) obtained his bachelor degree in Biomedical Sciences at the Zuyd University of Applied Sciences in Heerlen. In November 2009 he started working as a clinical laboratory technologist at the Central Diagnostic Laboratory (CDL) of the Maastricht University Medical Center (MUMC+). Parallel to his job at the CDL he commenced his master Biomedical sciences in 2011 at the University of Maastricht (UM) and graduated successfully in July 2013. Since June 2015 Kevin is working as a PhD student at the department of Medical Microbiology of the MUMC+ in collaboration with the Public Health Service (GGD) South Limburg and the UM Research school CAPHRI. His PhD project is about *Chlamydia trachomatis* viability.

Abstract

According to the guidelines for laboratory diagnosis of STIs a.o. provided by the Centers for Disease Control and Prevention (CDC), nucleic acid amplification tests (NAATs) are the preferred diagnostic method for CT infections. However, one of the major disadvantages of NAAT assays is that the available target DNA is amplified without discriminating between DNA originating from viable or non-viable CT. Several recent studies have shown that test positivity could be detected by NAATs up to 8 weeks post treatment. Hence, concerns have been raised about using NAAT as test of cure after antimicrobial treatment. Until today the true clinical implications (*e.g.*, transmission, sequelae, treatment and screening management) of prolonged test positivity are still unexplored. Assessing CT viability will provide more insights in the true meanings of these results. Assessment of viability by CT culture is the gold standard as it has a specificity of 100%. However, culture methods are labor- intensive, technically demanding, expensive, and lack sensitivity. Ultimately, our aim is to implement and use culture independent CT viability assays to explore the true implications of prolonged test positivity.

Amsterdam, 5 February 2016

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Curriculum Vitae

Jelmer Jukema is an Honours Programme student in the start of his academic career. His research is supervised by Prof. dr. Servaas A. Morré and Dr. Sander Ouburg. During secondary school in Leiden he followed the Leiden Pre-University Programme for top students. In 2014 he published his first article in the Netherlands Heart Journal called: “Waterpipe smoking: not necessarily less hazardous than cigarette smoking: Possible consequences for (cardiovascular) disease.”

Abstract

Research from Smirnova (Smirnova *et al*., 2003) has shown rare variants can make a big contribution to a prediction model. In this research we are going to investigate whether or not this is also true for a prediction model for *Chlamydia trachomatis*. In order to do so we will split a cohort of two hundred women into two groups: one for the susceptibility and one for the severity. In these women the rare variants of four genes will be examined. If these rare variants turn out to improve the prediction model, the rare variants of all hundred genes of a nearly developed prediction model will be determined.

Amsterdam, 5 February 2016

Martin Singer, MSc

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Curriculum Vitae

Martin Singer, born 26th of July 1989, has a bachelor of applied sciences degree and a master degree in biomedical sciences (VU University of Amsterdam). During internships at the laboratory of immunogenetics at the department of Medical Microbiology and Infecton Control of the VU Medical Center, he worked on *Chlamydia trachomatis* among other bacterial STDs. He studied genetics that influence the susceptibility and severity of a *Chlamydia trachomatis* infections as well as the influence of cytokines on the severity of the infection. The latter research has recently been published in Pathogens and Disease. He is now a PhD student at the laboratory of Immunogenetics and does additional research for Tubascan Ltd.

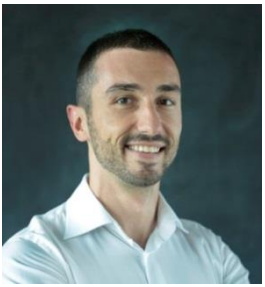
Abstract

Rab GTPases are small GTPases whose main function is the formation, transportation, and fusion of intracellular membrane vesicles. They are considered a main player when it comes to formation and maintenance of the *Chlamydia trachomatis* inclusion vesicle. However, little is actually known about the specific interactions between Rab GTPases and the inclusion containing *C. trachomatis*.

In this study we aim to identify specific Rab GTPase / effector relations linked to the formation and maintenance of the *C. trachomatis* inclusion. For this we will need to set up a *C. trachomatis* cell culture that we can insert our own Rab GTPases into. Using GFP vectors fused to the Rab proteins we will be able to see which active Rab GTPases localize near the *C. trachomatis* inclusion during critical stages of the inclusion maturation process.

In time this study will give us more insight into the inner workings of the *C. trachomatis* infected cell.

Amsterdam, 5 February 2016



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Curriculum Vitae

Ivan Branković, PhD, completed his diploma studies in Biology at the University of Belgrade (Serbia), majoring in microbiology and immunobiology. Upon receiving the MTEC scholarship he went on to do MSc studies in Public Health at Maastricht University. In December 2014 he successfully defended his PhD dissertation, on the topic 'Public Health Genomics of *Chlamydia trachomatis* and human papillomavirus (HPV)'. In the thesis, he researched immunogenetic (host) factors in these infections, and their association with host susceptibility to and severity of sequelae. Starting January 2015, Ivan has a shared appointment as a post-doctoral researcher at the Department of Genetics & Cell Biology (Maastricht University) and TubaScan Ltd., a spin-in company at the VU University Medical Center Amsterdam (in the setting of Prof.dr. S.A. Morré), furthering his research on *Chlamydia* host factors.

Abstract

Women with a certain genetic predisposition are more likely to develop tubal damage after genital infections with *Chlamydia trachomatis* (CT). How this takes place is not entirely understood. The aim is to develop an ex vivo fallopian tube organoid model and infect it with CT. I will examine the consequences of shutting off relevant host genes in order to determine their role in the infection and tubal damage. Selection of target genes is achieved through RNA interference screen, as well as GWAS- and candidate gene approach. I will furthermore introduce targeted mutations into these genes via the CRISPR/Cas9 editing assay and screen their effect on the course of the infection. The project is developed in collaboration with the Department of Molecular Biology at Max Planck Institute for Infection Biology (Berlin, Germany).

The research programme will be the first ever functional analysis of highly validated host factors associated with susceptibility to CT infection and CT-associated tubal damage in this model. It will also be the first delivery of specific mutations into this model. Achieving these objectives will be the basis for the development of a novel genetic diagnostic assay that will address the existing health need – it will improve the currently suboptimal diagnosis of women at

highest risk of tubal pathology, and reduce the referrals to invasive, psychologically burdening and costly laparoscopies.

Amsterdam, 5 February 2016

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Curriculum Vitae

Bob Sukel (1992) obtained his bachelor degree in Biomedical Sciences at the Vrije Universiteit of Amsterdam in 2015. After graduation he started the master Science and Business Management at the University of Utrecht. Currently he performs an internship at the National Institute for Public Health and the Environment (RIVM) in Bilthoven. The internship aims to get more insight in the products and quality of the supply and services of STI tests online in The Netherlands. In collaboration with SOA AIDS Netherlands.

Abstract

Objectives

To gain more insight into the extent of STI self-test usage in the Netherlands, make an overview of online Dutch self-test providers and compare the products and providers in a systemic manner to eventually propose a quality standard for online STI testing.

Method

A quality assessment on the information provision given by the websites of the providers will be conducted using multiple quality indicators. Examples of these indicators are: Basic information about the concerned STI, price of the test, partner notification, window period and presence of quality marks. All providers will be contacted by telephone or email and asked to provide information on the quality indicators that are missing from their websites, and additional information on number of tests sold, percentage tested positive and (quotes for) sensitivity/specificity of the test. We make a distinction between Home-tests, where the process of sampling and reading the result takes place at home, and Lab-tests, were the test is performed in a laboratory and the result are subsequently communicated. Secondly, a survey will be executed among young adults aged 16 to 24 to gain insight into the needs for STI-testing. What are the reasons to choose for a self-test or visit a clinic or general practitioner and how many people have experience with self-tests. Thirdly, we plan to evaluate the online STI test providers' follow-up procedure towards counselling, treatment and partner advice by ordering a chlamydia test.

Preliminary results

Information supplied by self-test providers is far from consistent; especially Home-test providers give insufficient background information on their websites. In some cases information essential to time and choose the right test, such as the window phase, STI-risk, route of transmission and reliability of the test is poorly discussed or not present. Lab-test providers more often score sufficient for the quality indicators. Two providers have been interviewed, more will follow; others have been contacted through telephone or by mail. The survey will be launched in the coming weeks.

Amsterdam, 5 February 2016

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Curriculum Vitae

Otilia Mardh, MD, MSc works for the ECDC since 2011 as a scientific officer for HIV/AIDS, sexually transmitted infections and hepatitis. As the project manager of the ECDC *Chlamydia* control in Europe project she coordinated the delivery of several technical reports: a literature review updating the epidemiology of chlamydia and the evidence-base for effectiveness of control interventions, a Member States survey (2012) describing chlamydia control activities and a qualitative evaluation of the first ECDC *Chlamydia* Control in Europe Guidance (2009) impact on policy changes. She has been part of coordination teams of the ECDC projects on Comprehensive approach to HIV/STI prevention in the context of sexual health, STI and HIV prevention in men having sex with men in Europe and is currently involved in the development of ECDC Guidance for antenatal screening for infections - addressing the vulnerable groups. Otilia also contributes to the epidemic intelligence and response activities in ECDC that aim at early detection and assessment of threats for human health in EU/EEA. Speaker in recent events: FIGO-SAFOG-SLCOG, Sri Lanka 2014, Ministerial conference – Women's health: a life course approach, Italy 2014, ISSTDR Vienna 2013, Policy Exchange symposium – Young people and sexual health, Brussels 2013.

Abstract

More than 3 million chlamydia cases have been reported between 2004 and 2013 to ECDC from EU/EEA countries. While young adults (<26 years old) are the most affected population group in all reporting countries, national rates varied largely on a background of heterogeneous control activities and surveillance settings across the Member States. In 2009, ECDC published its first *Chlamydia* control in Europe guidance aiming at supporting policy makers and national programme coordinators to develop, implement and improve chlamydia control activities. An updated version of the guidance is to be published soon by ECDC, reflecting results of recent scientific evidence reviews on the epidemiology and natural history of chlamydia and on the clinical and cost-effectiveness of screening programmes.

The 2016 ECDC guidance highlights that EU/EEA Member States should have a national strategy or plan for the control of STIs (including chlamydia). The

strategy should include provision of primary prevention interventions to groups at risk, evidence-based case management guidelines (with partner notification), improved surveillance systems and an evaluation plan for the strategy. Evidence exists that widespread testing can reduce reproductive tract complications (RR of pelvic inflammatory disease of all causes within one year after testing = 0.64 [95%CI 0.44-0.9]) but not the prevalence of infection. Hence, widespread opportunistic testing or a screening programme is only recommended if resources are available and suitable monitoring and evaluation is in place.
There are still marked gaps in the evidence base underpinning population level of chlamydia control; future research should focus on strengthening the knowledge on the natural history of infection and the impact of interventions at the population level.

Amsterdam, 5 February 2016

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Curriculum Vitae

Jan Henk Dubbink (1988) started as a medical student at the VU University Medical Center of Amsterdam in 2008 after two years of military training. During his master Medicine he started his PhD research (2013) through a study focusing on STI among rural South African women under supervision of Prof. dr. R.P.H. Peters (Anova Health Institute). Jan Henk graduated as a medical doctor in 2015 and currently works as a physician at an emergency department in Hoogeveen. He is still related to the Institute for Public Health Genomics (IPHG) at Maastricht University to finish his thesis entitled " Sexually transmitted infections in rural South African women – towards better control strategies" under supervision of Prof. dr. S.A. Morré.

Abstract

Objectives

To evaluate performances of different guidelines for the management of vaginal discharge syndrome (VDS) in women living in a rural setting in South Africa.

Methods

We conducted a secondary analysis of data from a cross-sectional study in Mopani District, South Africa. The guidelines (2015 and 2008) of the Department of Health (DoH) of South Africa and of the WHO were evaluated for adequate treatment of *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma genitalium*, and *Trichomonas vaginalis* infection.

Findings

Of the 489 women included in this analysis, 171 (35%) and 146 (30%) presented with VDS according to the DoH and WHO definition of VDS respectively. Fourty-two (56%) of the women with VDS would be treated adequately for these STI when using the 2015 DoH guideline, whereas 76% (p=0.01) and 64% (p=0.35) would receive adequate treatment with the 2008 DoH and WHO guidelines

respectively. Of the symptomatic women who tested negative for all four STI, STI treatment was provided to 36% using the 2015 DoH guideline, compared to 69% ($p<0.001$) and 67% ($p<0.001$) using the 2008 DoH and WHO guidelines respectively.

Conclusion

We confirm that few women with any of the four most common curable STI would receive adequate treatment when using a syndromic management approach. The asymptomatic nature of these STI and the lack of signs during examination of symptomatic women contribute to the poor performance of these guidelines. Furthermore many women without these STI receive broad-spectrum antibiotics. Therefore innovative approaches are warranted to improve STI control in these settings.

Amsterdam, 5 February 2016

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Curriculum Vitae

Menne Bartelsman (1978) graduated as a phycisian at the University of Amsterdam. After graduation he was (among other things) member of the editorial board of the *Nederlands Tijdschrift voor Geneeskunde* (Dutch Journal of Medicine) and a phycisian at Jellinek Verslavingszorg (addiction clinic). The past two years he has been working as a physician and PhD researcher at the STI clinic of the Public Health Service Amsterdam. His PhD research is focussed on the cost-effectiveness of point-of-care (POC) diagnostics of Chlamydia and gonorhoeae.

Abstract

Objectives To measure the diagnostic accuracy of the leucocyte esterase test (LET) as a point-of-care (POC) test to detect urogenital *chlamydia* among male patients of STI clinics in Suriname and the Netherlands.

Methods Prospective diagnostic accuracy multicenter study at the Dermatological Service in Paramaribo, Suriname, and at the STI outpatient clinic in Amsterdam, the Netherlands. Recruitment of study patients took place in 2008-2010 in Suriname and in 2009-2010 in the Netherlands. The urine of all patients was examined with the LET within two hours of sample collection. The reference diagnostic test for chlamydia was a nucleic acid amplification test (NAAT) (Aptima CT assay).

Results In Suriname 412 patients participated in the study and in the Netherlands 645. The prevalence of urogenital chlamydia in Suriname and the Netherlands based on NAAT was respectively 22.8% and 13.6%. The sensitivity of the LET to detect urogenital *chlamydia* in Suriname and the Netherlands was 91.6% (95%CI 84.6-96.0) and 77.3% (95%CI 67.7-85.1) respectively, the specificity was 38.1% (95%CI 32.8-43.5%) and 58.2% (95%CI 54.0-62.2) respectively, the positive predictive value (PPV) was 30.6% (95%CI 25.5-36.2) and 22.6% (95%CI 18.1-27.6) respectively and the negative predictive value (NPV) was 94.5% (95%CI 89.5-97.6) and 94.2% (95%CI 91.3-96.3) respectively. The area under the curve (AUC) of the receiver operating characteristic (ROC) curve was respectively 0.65 (95%CI 0.60-0.71) and 0.68 (95%CI 0.62-0.73).

Conclusions Compared to NAAT, the LET showed a reasonably high sensitivity but a low specificity in the detection of urogenital chlamydia among men. Further studies are needed in resource-limited settings to investigate whether the advantages of immediate treatment using the LET as POC test for urogenital *chlamydia* outweigh disadvantages of overtreatment such as side effects and antibiotic resistance induction.

Amsterdam, 5 February 2016

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Curriculum Vitae

Pierre Thomas was born in Belfort, France in 1991. He graduated from the bachelor in European Public Health (EPH) and from the Bachelor of Honors in International Health at Maastricht University (UM) in 2014. He then joined the Health Sciences Research Master at UM and specialized in clinical epidemiology. He currently completing his research internship at the Institute of Public Health Genomics in Maastricht, where he researches on the burden of *Chlamydia trachomatis* in India. Pierre has previously been involved in research in the Indian setting, mainly with the Institute of Public Health in Bangalore and the Public Health Foundation of India in collaboration with UNICEF in Hyderabad.

Abstract

Chlamydia trachomatis is one of the world´s most common bacterial Sexually Transmitted Infection (STI). It affects millions of people worldwide, but frequently remains undiagnosed due to lack of symptoms. *Chlamydia* is known to seriously impair the health of patients if left untreated, causing genitourinary infection and tubal damage in the long term. India is known as the biggest burden of infections worldwide. There are however very little accounts in the literature concerning the burden caused by *Chlamydia trachomatis* in the country. This present study aims at reviewing the literature for articles on the prevalence of the disease in different patient groups and across different geographical locations. A total of 28 articles were included and reviewed. The results are split into 3 main patient groups (symptomatic, infertile and pregnant women). The different sources of literature seem to indicate a high burden across these populations. The review also points at some discrepancies in testing practices, highlighting a need for streamlined and evidence-based guidelines for testing treatment and diagnosis of *C.trachomatis* in India.

Amsterdam, 5 February 2016

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Curriculum Vitae

Vitaly Smelov is an urologist with a strong interest in the “grey area” between urological disorders and sexually transmitted infections. He was graduated from the Military Medical Academy, St. Petersburg, Russia in 1993. His interest in the Made in Holland research on *Chlamydia* infections is rooting from the time of his NL-located awards: European Association of Urology’s Scholarship (prostate cancer markers, KUN, 2003) and Clinical Fellowship (HPV and prostate cancer, VUmc, 2007) and the UNESCO-American Society for Microbiology Travel Award (LGV, VUmc and GGD, 2006).

Dr. Smelov combines his clinical work with research and academia in a family planning center and the Department of Urology and Andrology in the North-Western State Medical University named after I.I. Mechnikov in St. Petersburg (Russia) as well as being a Visiting Scientist in Karolinska Institutet (Stockholm, Sweden) and the WHO/International Agency for Research on Cancer (Lyon, France).

Current topics of research interest includes: detection and clinical impact of *Chlamydia* and HPV infections, and their role in the development of genital malignancies (prostate, cervical and anal cancers).

Abstract

C. trachomatis (CT) infection is the leading cause of bacterial sexually transmitted infections in developed and developing countries. Limited data is available on the prevalence of CT among the Russian population, CT ethno-demographic characteristics and CT strain types. The presentation will raise the curtains on what we have learned so far about one of the BRICS country, focusing on the open-source available data on CT prevalence in different settings as well as the current CT diagnostic techniques.

Amsterdam, 5 February 2016

Nicole Dukers, PhD

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Curriculum Vitae

Dr. Nicole HTM Dukers-Muijrers (1972) is infectious diseases epidemiologist and coordinator research at the department of infectious diseases, public health service South Limburg, and also works at Caphri, Dept. Medical Microbiology, University Medical Centre, Maastricht. With a masters degree in Biological Health Sciences & Epidemiology, University of Maastricht, she obtained her doctorate (2002) at the University of Amsterdam. In total she has 20 years of relevant national and international work experience as a researcher and project leader on sexually transmitted infections, including *Chlamydia trachomatis*. She (co-)published about 100 papers in international peer-reviewed journals and is on the editorial boards of BMC Public Health and Frontiers in Public Health, section HIV. Her research interest is in the field of public health combining biological, behavioural and network assessments to gain a deeper understanding of the processes underlying acquisition, spread and control of infections. She is currently involved in a multicentre project on the post-treatment detection of *Chlamydia* (FemCure) and on the development of innovative online strategies to reach into networks with Chlamydia home-delivered tests.

Abstract

Substantial numbers of young people with *Chlamydia trachomatis* infection remain untested and untreated; these people remain hidden to care and contribute to ongoing transmission. It is challenging to reach these people with testing (and treatment). Therefore, innovative additional strategies are needed. Here we provide an overview of our recent studies that describe the rationale, the development and testing of new e-health strategies to reach these hidden high risk young people.

These strategies are peer-driven. This means that they employ the sexual and social network surrounding a person with a *Chlamydia* diagnosis. A sexual partner or a friend invites another young person at risk for chlamydia to perform a test. Results show that such peer-driven methods can be an acceptable and feasible addition to regular care in order to reduce the number of undetected *Chlamydia* infections among young people.

Amsterdam, 5 February 2016

Geneviève van Liere, PhD

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Curriculum Vitae

Geneviève van Liere (1987) graduated in Health Sciences - Infectious Diseases and Public Health in 2010 at the VU University in Amsterdam. She completed her Master thesis in Valencia, Venezuela. After graduation she started working as a researcher and data manager at the Public Health Service (GGD) South Limburg. In 2011, she started her PhD project under supervision of Prof dr. Hoebe and dr. Dukers-Muijrers, in collaboration with the department of Medical Microbiology, Maastricht University Medical Center. She successfully defended her PhD thesis entitled "*Chlamydia trachomatis* testing policy and control: the neglected role of the anorectal site" on December 14, 2015. She is currently working as a researcher and staff member at the Public Health Service South Limburg.

Abstract

Background

Anorectal and pharyngeal infections with Chlamydia trachomatis (CT) are commonly observed in men who have sex with men (MSM). There is increasing evidence that such infections at extra-genital sites are also common in women. In both sexes, these infections are largely overlooked as they are not routinely tested for in regular care. Testing based on sexual behavior or symptoms would only detect half of these extra-genital infections. This paper elucidates the differences and similarities between women and MSM, regarding the epidemiology of extra-genital CT. It discusses the clinical and public health impact of untested extra-genital infections, how this may impact management strategies, and thereby identifies key research areas.

Discussion

Extra-genital CT is as common in women as it is in MSM. The substantial numbers of extra-genital CT being missed in women and MSM indicate a need to test and treat more patients and perhaps different choices in treatment and partner management strategies. Doing so will likely contribute to reduced

morbidity and transmission in both sexes. However, in our opinion, it is clear that there are several knowledge gaps in understanding the clinical and public health impact of extra-genital CT. Key research areas that need to be addressed concern associated morbidity (anorectal and reproductive morbidity due to extra-genital infections), 'the best' management strategies, including testing and treatment for extra-genital CT, extra-genital treatment resistance, transmission probabilities between partners and between anatomic sites in a woman, and impact on transmission of other infections. Data are also lacking on cost-effectiveness of pharyngeal testing, and of anorectal CT testing in women. Gaps in the management of extra-genital CT may also apply for other STIs, such as *Neisseria gonorrhoeae* and *Mycoplasma genitalium*.

Summary

Current management strategies, including testing, to address extra-genital CT in both sexes are suboptimal. Comparative data on several identified key themes in women and MSM are lacking and urgently needed to guide better management of extra-genital infections.

Amsterdam, 5 February 2016

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Curriculum Vitae

Dr. Janneke Heijne specializes in combining mathematical modelling and epidemiology to investigate the impact of interventions to control transmission of sexually transmitted infections. She obtained her PhD at the University of Bern, Switzerland in the department of social and preventive medicine (ISPM). Her PhD thesis focused on *chlamydia* (re)infections. She now works as a post-doc at the STI department of the RIVM, the Netherlands.

Abstract

Introduction. Anorectal *chlamydia trachomatis* (Ct) testing in women is not standard. In some countries, women are being tested based on reported anal intercourse. However, universal anorectal Ct testing in STI clinics revealed prevalences over 10%, irrespective of anal intercourse, and showing high co-occurrence with urogenital infections. To inform control strategies in women, this study explores different transmission mechanisms that can explain the high observed Ct prevalences using mathematical modelling.

Methods. We developed a pair compartmental model of heterosexuals aged 15–29 years. To inform the model, data on anorectal and urogenital infections are used from heterosexual men and women attending STI clinics. In the model, women can have urogenital and anorectal infections, men only urogenital infections. At all sites, individuals can either be susceptible (S), infected (I) or recovered (R). All partnerships engage in vaginal intercourse, and a fraction of partnerships will also have anal intercourse. We developed models including different transmission mechanisms, *e.g.* transmission by anal sex and autoinoculation between anatomic sites, and explored which mechanisms or combinations thereof fit the observed data best.

Results. Most models did fit to the observed prevalence of male and female urogenital Ct: 13.6% (95%CI: 10.7-17.2) and 13.0% (95%CI: 12.4-13.7), female anorectal Ct: 10.6% (95%CI: 8.0-13.9) and both sites: 9.9% (95%CI: 7.4-13.1). Models that assumed autoinoculation between anatomic sites fitted the data best, compared to models that focused on anal sex only. The model will be used to further determine the impact of testing strategies (*i.e.* universal irrespective of anal intercourse) and treatment strategies (*i.e.* azithromycin or doxycycline) on population prevalence.

Conclusions. The results are suggestive of a Ct autoinoculation process between anatomic sites in women. This has potential consequences for future *chlamydia* control strategies including testing and treatment.

Amsterdam, 5 February 2016

Esmée Lanjouw, MD

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Curriculum vitae

Esmée Lanjouw was born on November 19th, 1979, in Meppel, the Netherlands. She started the study Medicine in Rotterdam at the Erasmus Medical Centre University in 1999. She obtained the medical degree in 2006. In 2008 she started her training to become a consultant dermatology at the Erasmus Medical Centre Rotterdam. In 2010 she was a registrar dermatology at the Royal Liverpool Hospital & Broadgreen University Hospitals NHS Trust and the Alder Hey children's hospital in Liverpool, UK, for one year. In 2008 she started to investigate clinical, serological and host genetic aspects of *Chlamydia trachomatis* infections at the dermatology department at the Erasmus MC and at the department of immunogenetics of the VU University Medical Centre under supervision of Prof. dr. Servaas Morré, leading to the start of her thesis "*Chlamydia trachomatis*, clinical and immunogenetic aspects of a silent love bug". She finished her dermatology training in April 2014 and is currently working as a consultant dermatology at Polikliniek de Blaak in Rotterdam.

Abstract

On 24 November 2015, the evidence-based '2015 European guideline on the management of *Chlamydia trachomatis* infections' was published online [1]. This guideline is a comprehensively updated version of the 2010 European *C. trachomatis* guideline and provides up-to-date and detailed guidance regarding the testing, diagnosis, treatment and general management of *C. trachomatis* infections in Europe. The important updates include, for example:

broader indications for testing and treatment of *C. trachomatis* infections;

clearer recommendation of using exclusively validated and quality assured highly sensitive and specific nucleic acid amplification tests for diagnosis;

advice on (repeated) *C. trachomatis* testing;

recommendations of increased testing particularly at sexually transmitted infections and sexual health clinics to reduce the incidence of pelvic inflammatory disease and prevent exposure to infection;

recommendations to identify, verify and report *C. trachomatis* variants.

Details are also available in the newly launched guideline regarding the aetiology, transmission, clearance, epidemiology and taxonomy of *C. trachomatis*, clinical features, recommended diagnostics (including quality assurance), advice for *C. trachomatis* infected patients, indications for therapy, recommended and alternative treatment regimens for urogenital and extragenital *C. trachomatis* infections, contact tracing and management, and the notification of *C. trachomatis* cases [1]. For further details regarding background, evidence base of recommendations and discussions, see also the published background review for the guideline [3].

C. trachomatis infection, which most frequently is asymptomatic, is the most common bacterial sexually transmitted infection and a major public health concern globally. In 2012, the World Health Organization (WHO) estimated 130.9 million urogenital cases among adults worldwide (8.9 million in the WHO European region) [4]. In the European Union (EU) and European Economic Area (EEA), 384,555 chlamydial cases were reported in 26/31 EU/EEA Member States (incidence: 182 cases per 100,000 population) in 2013. The incidence was higher among females (incidence: 207) than in males (incidence: 153) [5]. The true incidence is certainly significantly higher, due to the asymptomatic nature of chlamydial infection, lack of sufficient testing, appropriate diagnostic methods and surveillance systems across Europe. For example, 83% of all cases were reported in four countries (Denmark, Norway, Sweden and the UK). Two thirds of all chlamydial infections were reported in the 15–24 years age group, with the highest incidence among females 20 to 24 years of age (incidence: 1,717). Heterosexual transmission accounted for 88% of cases. In countries reporting consistently between 2004 and 2013, the overall reporting rate has increased by 68%.

Amsterdam, 5 February 2016

Carolien Wind, MD

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Curriculum Vitae

Carolien Wind graduated from medical school at the Utrecht University in The Netherlands in 2010. Since 2012 she is working as a PhD-student at the Public Health Service Amsterdam and the Academic Medical Center in Amsterdam, The Netherlands. Her research projects concern antimicrobial resistance in *Neisseria gonorrhoeae*.

Abstract

Objectives Concern about the efficacy of azithromycin as the first-choice treatment for anogenital *Chlamydia trachomatis* infections increases. With up to 90% asymptomatic infections, persistence of *C. trachomatis* can remain undetected in many patients. Performing a test of cure (TOC) for chlamydia could amend this, but recommendations for the timing of a TOC using nucleic acid amplification tests (NAATs) are inconsistent. We assessed clearance of *C. trachomatis* using modern RNA- and DNA-based NAATs.

Methods From a cohort of patients with *Neisseria gonorrhoeae* visiting the STI Clinic Amsterdam from March through October 2014, we included those with *C. trachomatis* co-infection. After treatment with ceftriaxone plus either azithromycin or doxycycline, patients self-collected anal, vaginal and urine samples during 28 consecutive days. Tests were performed with an RNA-based NAAT (Aptima Combo 2) and a DNA-based NAAT (Cobas 4800). We defined clearance as three consecutive negative results, and defined blips as isolated positive results following clearance.

Results We included 23 patients with *N. gonorrhoeae* and *C. trachomatis* co-infection. All patients cleared *C. trachomatis* during follow-up. The median time to clearance (range) was 7 days (1-13) for RNA and 6 days (1-15) for DNA. The risk of finding a blip after clearance was 4.4% and 1.7%, respectively.

Conclusion We recommend a TOC for anogenital chlamydia at least 14 days after treatment, for modern RNA- and DNA-based assays. A positive result after 14 days does not need to represent treatment failure, but may also represent reinfection or a blip.

Amsterdam, 5 February 2016

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Curriculum vitae

Bart Versteeg, born on April 15th 1987, has a bachelor of Applied Science degree and a master degree in Biomedical Sciences (VU University of Amsterdam). In 2013, he started as a PhD student at the Public Health Laboratory of the Public Health Service (GGD) Amsterdam, the Netherlands. His PhD research mainly focusses on the molecular epidemiology of *Chlamydia trachomatis*.

Abstract

Introduction

Chlamydia trachomatis (Ct) genovars D-K cause non-invasive urogenital infections, which often remain asymptomatic. Little is known about the invasion of the epithelial layer and the subsequent effects of Ct on the epithelium in humans.

Objective

The objective of this study was to develop a human urethral 3D in vitro equivalent to gain a better insight into the invasiveness of Ct in host tissue.

Methods

Human organotypic urethral equivalents were constructed by seeding primary urethral keratinocytes and fibroblasts (passage 0) respectively on top of and into a collagen matrix and culturing them for 2 weeks. Urethral cells were isolated from urethral clinical specimens of transgender patients undergoing gender surgery at VUMC. Histology of urethral clinical specimens and urethral equivalents were assessed. Urethral equivalents were incubated with a Ct genovar D strain, by placing a Ct impregnated nylon gauze on top of each model. Standard Ct cell culture, existing of HeLa cells grown on coverslips, were used as a control to assess growth of Ct strains used for infections of the urethral equivalents. Immunofluorescence staining and microscopy was used to assess the extent of Ct invasion in the urethral equivalents and controls. Ct invasion was assessed after 2, 4 and 6 days of incubation.

Results

After 2 to 3 weeks of culture the urethral equivalents consisted of a fully differentiated urethral epithelium on a urethral fibroblast populated collagen

hydrogel. The epithelium consisted of multiple differentiated cell layers resembling native urethral tissue. We successfully infected urethral equivalents with a Ct genovar D strain. Ct invasion and expansion was detected in the epithelial layer, but not in the underlying collagen matrix, at 2, 4 and 6 days post infection. Morphological changes of the urethral equivalent could be observed at 2, 4 and 6 days post infection compared to non-infected urethral equivalents, whereby it appears that the epithelial layer grows around the invaded Ct bacteria.

Conclusion

We were able to construct a urethral equivalent resembling native urethral tissue. Moreover, these urethral equivalents could successfully be infected and thus invaded using a Ct genovar D strain, making this a promising model to investigate the human pathogenesis of urogenital Ct infections.

Amsterdam, 5 February 2016

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Curriculum Vitae

Yvonne Pannekoek received her M.Sc. in 1987 at the University of Amsterdam where she studied Biology with emphasis on Molecular Microbiology. She graduated in 1993, at the University of Amsterdam, Dept. of Medical Microbiology of the Academic Medical Center, thesis entitled “Identification of Neisserial stress proteins: Molecular and immunological properties of Neisserial Hsp60”. A part of her PhD work was carried out at the Max-Planck-Institut für Biologie, Abt. Infectionsbiologie, Tübingen, Germany, former laboratory of Prof. dr. Thomas F. Meyer were she worked as a visiting research fellow. After her graduation she joined the laboratory of Prof. dr. Patrik M. Bavoil, at that time situated in the University of Rochester, Dept. of Microbiology and Immunology, NY, US, where she worked as a postdoctoral fellow on the pathogenesis of *Chlamydia* infections. During that period she discovered the type III secretion system of *Chlamydia*. For this work she, together with other members of the Bavoil lab, received the best poster award during the Third European *Chlamydia* meeting that was held in 1996 in Vienna, Austria. In 1995 she returned to the Dept. of Medical Microbiology at the AMC in Amsterdam were she currently is appointed as Assistant Professor. Her main interests are the pathogenesis and molecular epidemiology of infections caused by *N. meningitidis*, *S. pneumoniae*, and *Chlamydiae*.

Abstract

The *Chlamydiaceae* are a family of obligate intracellular bacteria characterized by a unique biphasic developmental cycle. It encompasses the reunited single genus *Chlamydia*, which involves nine species. Members of these species affect a wide range of vertebral hosts, ranging from asymptomatic carriage to infections with serious impact on human health as well as on farming and veterinary industries. Recently, two novel species of *Chlamydia* were described *C. gallineacea* (natural hosts: domestic poultry, guinea fowl, turkeys, ducks, other birds) and *C. avium* (natural hosts: psittacines and pigeons). Genome differences of *Chlamydiaceae* rely on the occurrence of mutations in the orthologous genes (n >700), as well as on events of recombination, gene loss, inversion, and paralogous expansion. In addition, genes essentially encoding polymorphic and transmembrane head membrane proteins, type III secretion effectors and some metabolic pathways

contribute to variation between spp. Procedures for molecular typing have allowed the knowledge of molecular epidemiology patterns for some species. Here I will present a comprehensive overview of methods used for typing of members of *Chlamydia* with zoonotic potential.

Amsterdam, 5 February 2016

Marloes Heijne, MSc

Veterinary Microbiologist in training at Central Veterinary Institute (CVI), part of Wageningen UR

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Curriculum Vitae

At CVI I hold a position as a veterinary microbiologist in training with a focus on bacteriology and in particular zoonoses. Veterinary microbiology is a Dutch specialisation for veterinarians. It takes four years of training, two years of practical training and two years of research. Currently I am working on several psittacosis research projects. I hope to continue this research in a PhD program. In 2008 I graduated as a veterinarian and worked in a farm animal practice for 3 years. Subsequently I worked as a junior lecturer at the Farm Animal Health department of the faculty of Veterinary Medicine in Utrecht. In 2012 I applied for a position as veterinary microbiologist in training at CVI. CVI is the national reference laboratory for notifiable animal diseases in the Netherlands and holds expertise on antimicrobial resistance, zoonoses, preclinical studies and epidemiology.

Abstract

Psittacosis is a zoonotic disease caused by the bacterium *Chlamydia psittaci*. In the Netherlands it is notifiable disease in man and pet birds, but not in poultry. On a yearly base thirty to seventy animal cases and forty to eighty human cases are reported to veterinary or public health authorities, but this might be an underestimation of the actual number of cases.

Within the research project Plat4m-2bt-Psittacosis veterinary and human data on the presence, prevalence and disease burden of psittacosis will be collected. A web based platform is built to exchange these data and facilitate source finding by infectious disease control professionals. Furthermore, in depth knowledge about human and veterinary psittacosis will be gathered.

We believe better knowledge and cooperation will help to reduce the disease burden of psittacosis. Successful implementation of the platform to beat psittacosis will provide a proof of principle to control other notifiable and emerging zoonoses in the future.

Amsterdam, 5 February 2016

Cindy de Boeck, Da

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Curriculum Vitae

In 2005 I obtained a Bachelor in Veterinary Medicine at the University of Antwerp, but did not continue to the Master program. In 2009 I graduated as a Mater in Biomedical Sciences, Clinical Scientific Research, with distinction, at the University of Antwerp.
In 2009 I continued the Master program of Veterinary Medicine, and graduated from the University of Ghent as Master Veterinary Medicine in 2012.
From 2013 until present I worked as a PhD candidate at the department of Animal Production at the faculty of Bioscience Engineering, under guidance by Prof. Dr. Daisy Vanrompay.

Abstract

Chlamydia psittaci (*C. psittaci*) is an obligate, intracellular Gram- negative bacterium causing respiratory disease in birds. The pathogen causes economic losses in poultry due to mortality, inferior food conversion, growth retardation, carcass condemnation at slaughter and antibiotic use. No vaccine is available. Antibiotic (tetracyclines) treatments are often used. In this study, the recombinant major outer membrane protein (rMOMP) was evaluated as a vaccine on a chicken broiler farm. Two groups of 300 chickens were used in this pilot experiment. One group was vaccinated (spray) and the other one received a placebo vaccine. Twenty-five broilers in each group were individually marked for weekly examination of clinical signs and for taking blood and swabs (pharyngeal + cloacal). The feed conversion was recorded. Blood was examined for the presence of *C. psittaci* antibodies (ELISA) and chlamydia excretion was examined by inoculating the swab contents on BGM cells. Results will be presented.

Amsterdam, 5 February 2016

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Curriculum Vitae

Nynke de Vrieze studied medicine at the Academic Medical Center of the University of Amsterdam.She worked at the STI Outpatient clinic in Amsterdam for almost two years and combined clinical work at the clinic with research. She is currently employed as a dermatology resident at the University Medical Center in Utrecht and is still related to the STI clinic in Amsterdam to finish her thesis which includes epidemiological studies of Lymphogranuloma Venereum and other STI.

Abstract

Introduction

Several guidelines (BASHH, WHO/USTI and CDC) recommend routine screening for anorectal lymphogranuloma venereum (LGV) in men who have sex with men (MSM). None recommend screening of urethral LGV infections. However, urethral LGV infections might play an important role in the ongoing transmission of LGV infections among MSM. Therefore our aim was to study the prevalence of urethral LGV among MSM visiting the STI clinic in Amsterdam, the Netherlands.

Methods:

We prospectively collected all urethral *Chlamydia trachomatis* (Ct)-positive samples from MSM visiting the Amsterdam STI clinic between March 2014 and April 2015. Samples that tested positive by transcription mediated amplification (TMA) screening assay (Aptima Combo test, Hologic, USA) were typed using an in-house pmpH qPCR to differentiate between LGV and non-LGV type infections.

Results:

During the inclusion period, 12,556 MSM were tested for urethral Ct infections of whom 431 (3.2%) tested chlamydia positive. Of these, 339 (78.7%) were negative for an LGV type infection, 84 (19.5%) were inconclusive and 8 (1.9%) samples were positive for an LGV type infection. Overall, we found a prevalence of 0.06% (8/12,556) among MSM visiting the Amsterdam STI clinic. During the same period we found an anorectal LGV-type prevalence of 0.75% (120/16008) among MSM visiting the Amsterdam STI clinic.

Conclusion

The observed prevalence of urethral LGV infections (0.06%) is far lower compared to the prevalence of anorectal LGV infections of 0.75% found among MSM visitors of the STI clinic. Despite the low prevalence, these infections would be missed in the current diagnostic algorithm and could subsequently contribute to the ongoing transmission of LGV infections. Routine screening of urethral LGV infections might not be feasible for all MSM, however, awareness, screening of partners, and prompt treatment of LGV infections is crucial for the individual patient and prevents ongoing transmission and possible severe outcomes.

Amsterdam, 5 February 2016

Bernice Hoenderboom, MSc

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Curriculum vitae

Bernice Hoenderboom (1988) graduated in Health Sciences, specialization Infectious Diseases and Public Health in 2014 at the VU University in Amsterdam. She completed her master thesis about HIV drug resistance in Sub Saharan Africa, at the Amsterdam Institute for Global Health and Development. Results of the study were published in Clinical Infectious Diseases. After graduation, she worked at the Public Health Services (GGD) in Haarlem at the STD department. Since June 2015, she is working as a PhD student at the National Institute for Public Health and the Environment in collaboration with the Laboratory of Immunogenetics at the VU medical center. Her PhD project is about long-term complications of *Chlamydia trachomatis* infections in women.

Abstract

Background: *Chlamydia trachomatis* (Ct) is the most common bacterial sexually transmitted infection in the Netherlands. To assess the risk of late complications from Ct infection in women, we started the Netherlands *Chlamydia* Cohort Study (NECCST). In NECCST, we aim to collect information on previous Ct infections from available prior test results, self-reported infections as well as by Ct antibody detection. In this study, we will evaluate the most optimal method for self-collection of whole blood for Ct antibody detection, as a marker of previous Ct infection.

Objective: Different self-sampling methods for blood collection for Immunoglobulin G (IgG) antibodies tests for prior Ct infection will be tested and compared.

Method: We choose to use a reliable and commercially available Ct IgG test kit for serum samples (Ct IgG pELISA, Medac). First, we evaluated Ct IgG antibody levels in dried Blood Spots (DBS) using different elution protocols and anonymous paired serum and DBS samples collected in STI/HIV clinics for an earlier study, in both the laboratory of Maastricht University Medical Center

(MUMC) and the laboratory VU Medical Center (VUMC). Second, we aim to compare IgG detection in DBS with IgG detection in self-collected (fingerprick) blood samples in collection tubes. To evaluate assay performance and pilot the procedures, we already collected some fresh samples and aim to expand this further. OD values of serums tests will be compared to OD values of DBS tests using Bland-Altman plots. In addition, sensitivity and specificity will be calculated.

Preliminary results: Ct IgG antibody detection levels in DBS were variable; the sampling method by use of collection tubes appears to be more promising and will be further evaluated. This method will most likely be used for the NECCST study. Preliminary results will be discussed at the meeting.

Amsterdam, 5 February 2016

Eleanne F. van Ess, MD

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Curriculum Vitae

Eleanne van Ess was born in Heemskerk, The Netherlands in 1989. She graduated from a bachelor in Biomedical Sciences and a master in Medicine at the VU University. In March 2016 she will start her PhD project at the Immunogenetics Lab at the VU medical center in Amsterdam under the supervison of Prof. Servaas Morré, and Drs. Sander Ouburg and Joke Spaargaren.

Abstract

This study focusses on improving the prediction model of tubal pathology in subfertile women. Since current CT serology is neither sensitive nor specific enough to accurately predict tubal pathology, a better CT serology test is needed. In this study a new test that detects a variaty of IgG antibodies directed to CT is tested and compared to the clinical finding of the patients, in order to improve the tubal pathology prediction model.

Amsterdam, 5 February 2016

Marleen Jansen, PhD

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Curriculum vitae

Marleen Jansen works within the field of Public Health Genomics. As a PhD candidate, this translated into two research areas, one area on implementation research in the context of infertility, studying the possibility of improving the diagnosis of infertility by adding genetic information. The other research area focussed on newborn screening policy, studying future expectations of genomics and their implications on health care policy and guidelines.
Her main goal in research is trying to see from different levels of implementation how we can translate genetic information in a responsible way to maximize our gain in health. Therefore the research she is currently involved in studies Personalized Medicine and the feasibility in health care.

Abstract

Untreated *Chlamydia trachomatis* (CT) infection can cause tubal factor infertility (TFI). There have been promising results combining CAT and a persistent inflammation marker: C-reactive protein (CRP), which could increase accuracy in screening for TFI and may prevent unnecessary invasive laparoscopies. Serological data was collected by CAT for specific IgG with pELISA, and for CRP using hsCRP testing. TFI diagnosis was based on laparoscopy scores: there were 48 cases – 10 suffered double sided TFI. We were not able to confirm the data from Den Hartog et al. (2005), and 70 of 176 women followed an unusual diagnostic path: they tested negative for CT, but did undergo a laparoscopy.
A different CAT was used than in the study of Den Hartog et al. (2005), furthermore the sample size was smaller, and a considerable amount of our participants were referred for laparoscopy while they had a negative CAT, indicating a possible confounding medical indication to suspect TFI.
The results in our study and additional information from literature suggest that re-evaluating the accuracy of pELISA as screening method, and selecting relevant inflammatory factors could prove beneficial in accurate screening for TFI.

Amsterdam, 5 February 2016

Symposium Organizer
Servaas A. Morré

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Curriculum vitae

Professor Servaas A. Morré is working on *Chlamydia trachomatis* infections for over 20, with a central focus on female infertility and women's reproductive health. He is a serial entrepreneur in the field of infectious disease diagnostics and human biomarkers. Coordination of large international consortia funded by European money is the basis for his translational output.
Education: He graduated at the VU University, The Netherlands, in Biochemistry and Molecular Biology in 1994. His internships were at The Zaadunie, Department of Cell biology on plant genetics: polyploidization of Brassica oleracea (Cauliflower) during cell culture (M. Tan, PhD) and at the Department of Biochemistry and Molecular Biology VU on processing of ribosomal RNAs in Saccharomyces cerevisiae (Prof. H. Raué, PhD). His PhD thesis (1999) was performed at Department of Pathology (VU University, Amsterdam) on the epidemiology, transmission, natural course, diagnostics and immunopathogenesis of human urogenital *Chlamydia trachomatis* infections. Finally, in 2009-2010 he got his Master in Biobusiness and Entrepreneurship.
Positions: He is currently working as Head of the Laboratory of Immunogenetics (started in 2001), VU University medical center, Amsterdam and as Director of the Institute of Public Health Genomics (IPHG) (started in 2011), University of Maastricht. From Feb 2012 he is Professor Host-pathogen Genomics in Public Health at IPHG. Since 1st of Sept 2009 the coordinates the Dutch *Chlamydia trachomatis* Reference Laboratory (Amsterdam) for the RIVM including specific CT research tasks and since 1st of January 2014 together with Prof.dr. Christian Hoebe (Maastricht).
Studies abroad: As an Erasmus Fellow he studied at the Universidade Do Porto, Laboratório de Genética Molecular, Portugal, on POLO: an essential kinase for mitosis in Drosophila melanogaster (Prof. C. Sunkel, PhD). As a postdoc, the Van Coeverden Adriani Foundation made it possible to extend his Chlamydial research at the Department of Infectious Diseases, The City of Hope Medical Center, California, USA, in collaboration with Dr. Joseph Lyons, specialists in murine modeling in a period of 5 years yearly visits were made, the longest 4 months.
Research, grants and consortia: He is working on infectious diseases for more than 20 years and has over 175 publications, from which most are on *Chlamydia trachomatis*. His research is for the major part focused on the immunogenetics of infectious diseases with special attention to *Chlamydia trachomatis* and Bacterial meningitis (collaboration Pediatrics, VUmc). He was Scientific Consortium Director, of the European Framework Programme 6 (FP6) grant (LIFESCIHEALTH FP6, Co-ordination Actions (CA)) on functional genomics research entitled: "Contribution of molecular epidemiology and host-pathogen genomics to understand *Chlamydia trachomatis* disease (Acronym: (EpiGenChlamydia)" with 20 European, African and US groups. This consortium had his first meeting on 12 December 2007. This consortium is extended via new collaborative activities including a EuroTransBio grant (Start 2012) and a Eurostars grant (Start July 2015) into a spin-in company (TubaScan Ltd). As a partner he is participating in several other European programmes and grants.
Organisation on scientific meetings: Together with Prof. Salvador Peña, he organised the "First Annual Amsterdam *Chlamydia* Meeting" (AACM) in December 2004 and 6th of February 2015 he organized together with Dr. Sander Ouburg the Lustrum "10th AACM". In July 2005 at the 16th Biennial meeting of the International Society for Sexually Transmitted Diseases Research (ISSTDR) he was a member of the Scientific Committee and organized amongst others the workshop "Immunogenetics of *Chlamydia trachomatis* Infections", with Prof. David Mabey (London, UK, Trachoma research). He was organizing Committee member of 6th Meeting of the European Society for Chlamydia Research, University of Aarhus, Aarhus, Denmark, July 1-4, 2008 and at this meeting also session organizer: "Immunogenetics of *Chlamydia trachomatis* infections". Finally, together with Dr. Sander Ouburg he was the organizer of the 7th Meeting of the European Society for *Chlamydia* Research in 2012 (1-6 July) in Amsterdam, a meeting held only once every 4 years. The Netherlands is one of the three competitors for the organisation of the International *Chlamydia* meeting in 2018 to be held in the province of Utrecht, he coordinated the application which was defended in the first round in Australia by Prof.dr. Henry de Vries.

Entrepreneurship: Intellectual Property has been obtained and linked to several VUmc Spin-in companies including Microbiome Ltd, (Co-Founder and Co-Director) which won the Amsterdam Inventor Award in 2008 and the FD Gazellen Award in December 2011 and 2012. The second spin-in company founded is named TubaScan Ltd (Founder & Director since 2011) a company focusing on medical diagnostics on the basis of human biomarkers including host genetic markers amongst others for Periodontitis, Rheumatology, Female subfertility and HLA typing.

Future STI / *Chlamydia* Meetings

14h German *Chlamydia* Workshop
March 16 - 18 2016, Freiburg, Germany
http://www.chlamydienworkshop.org/

12th Annual Amsterdam *Chlamydia* Meeting (AACM)
2017, Amsterdam, The Netherlands

8th European Society for *Chlamydia Research* (ESCR) meeting
September 6th – 9th 2016, Oxford, United Kingdom

8th *Chlamydia* Basic Research Society (CBRS) meeting
2017

14th International Symposium on Human *Chlamydial* Infections (ISHCI)
2018

Amsterdam, 5 February 2016

An overview of PhD work in The Netherlands on *Chlamydia trachomatis*

Table I: *PhD theses in the Netherlands*

2016 Marleen Jansen	VU University Amsterdam / Maastricht University
2015 Geneviève van Liere	Maastricht University / Public Health Service ZL
2014 Jelena Malogajski	Maastricht University / VU University Amsterdam
2014 Ivan Brankovic	Maastricht University / VU University Amsterdam
2014 Rianne Vriend	University of Amsterdam / Public Health Services (GGD) Amsterdam
2014 Jannie van der Helm*	University of Amsterdam / Public Health Services (GGD) Amsterdam
2014 Stephan P. Verweij*	VU University Amsterdam
2014 Reinier Bom*	University of Amsterdam / Public Health Services (GGD) Amsterdam
2013 Jonathan Lal	Maastricht University / VU University Amsterdam
2013 Laura van Dommelen*	Maastricht University
2013 Marlies Heiligenberg*	University of Amsterdam / Public Health Services (GGD) Amsterdam
2012 Janneke Heijne*	University of Bern / RIVM
2011 Ouafae Karimi	VU University Amsterdam
2011 Koen D. Quint*	VU University Amsterdam
2010 Caroline J. Bax*	University of Leiden / Medical Center Haaglanden
2010 Janneke E. den Hartog*	Maastricht University
2010 Ingrid Rours	Erasmus University Rotterdam
2008 Liesbeth Duijts*	Erasmus University Rotterdam
2007 Denise A.M. Perquin	University of Leiden / Medical Center Haaglanden
2006 Sander Ouburg	VU University Amsterdam
2006 Joke Spaargaren*	University of Amsterdam and VU University Amsterdam
2006 Tanja P. Gijsen*	Maastricht University
2006 Hannelore M. Götz*	Erasmus University Rotterdam
2005 Jan E.A.M. van Bergen*	University of Amsterdam
2004 Joseph M. Lyons*	City of Hope Medical Center, CA, USA, and VU University Amsterdam
2003 Laura S. Murillo	VU University Amsterdam
2002 Monica Molano Luque	VU University Amsterdam
2001 Irene G.M. van Valkengoed*	VU University Amsterdam
1999 Servaas A. Morré*	VU University Amsterdam
1999 Johannes W. Trum	University of Amsterdam
1999 Bernardus W.J. Mol	University of Amsterdam
1998 Yvonne T.H.P. van Duijnhoven	University of Amsterdam
1997 Marita J.W. van de Laar	University of Amsterdam
1995 Jar Lan*	VU University Amsterdam
1994 Josina van Ulsen	Erasmus University Rotterdam
1994 Jacobus M. Ossewaarde*	University of Utrecht
1993 Hans J.H. Theunissen*	Erasmus University Rotterdam
1992 Johannes T.M. van der Schoot*	University of Amsterdam
1992 Arent J.P. Boeke and Janny H. Dekker	VU University Amsterdam
1992 André H. van der Willigen	Erasmus University Rotterdam
1991 Eric C.J. Claas	VU University Amsterdam
1990 Gijsbertus J.H.M. Ruijs*	Rijksuniversiteit Groningen
1989 Henk J. Vonsée	Rijksuniversiteit Limburg

1987 Kie H. Tjiam*	Erasmus University Rotterdam

**Chlamydia trachomatis* is the major focus in the thesis.

Ranking position for number of theses 1987-2016: VU 17, UVA 11, Erasmus 7, UM 9

Table II: *Current PhD fellows working (partially) on* Chlamydia trachomatis.

Anne Dirks	Maastricht University / Public Health Service ZL
Kevin Theunissen	Maastricht University / Public Health Service ZL
Eleanne van Ess	VU University Amsterdam
Martin Singer	VU University Amsterdam
Dewi de Waaij	VU University Amsterdam
Monique Pereboom	VU University Amsterdam
Esmée Lanjouw	VU University Amsterdam
Jan Henk Dubbink	VU University Amsterdam / Maastricht University
Bernice Hoenderboom	VU University Amsterdam / RIVM
Vitaly Smelov	VU University Amsterdam and St. Petersburg State Medical University, Russia
Bart Versteeg	University of Amsterdam / Public Health Services (GGD) Amsterdam
Charlotte van der Veer	University of Amsterdam / Public Health Services (GGD) Amsterdam
Nynke de Vrieze	University of Amsterdam / Public Health Services (GGD) Amsterdam
Menne Bartelsman	University of Amsterdam / Public Health Services (GGD) Amsterdam
Martijn van Rooijen	University of Amsterdam / Public Health Services (GGD) Amsterdam
Amy Matser	University of Amsterdam / Public Health Services (GGD) Amsterdam
Titia Heijman	University of Amsterdam / Public Health Services (GGD) Amsterdam
Roel Achterbergh	University of Amsterdam / Public Health Services (GGD) Amsterdam

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An overview of PhD work on *Chlamydiae*

Table III: *PhD theses on* Chlamydiae

2014 Evelien de Clercq	Ghent University, Belgium	C/CT
2013 Lizi Yin	Ghent University, Belgium	CPs/CAb
2011 Veerle Dickx*	Ghent University, Belgium	CPs
2010 Katelijn Schautteet*	Ghent University, Belgium	C / CT
2010 Caroline van Droogenbroeck*	Ghent University, Belgium	CPs
2009 J.J.M. Bouwman	Utrecht University, The Netherlands	CP
2009 Delphine Beeckman*	Ghent University, Belgium	CPs
2008 Kristel Verminnen*	Ghent University, Belgium	CPs
2008 Taher Harkinezhad*	Ghent University, Belgium	CPs
2008 M.D. de Kruif	University of Amsterdam, The Netherlands	CP
2007 Edou R. Heddema*	University of Amsterdam, The Netherlands	CPs
2007 Ellen Boelen*	Maastricht University, The Netherlands	CP
2006 Arnaud Daniël Hauer	Leiden University, The Netherlands	CP
2005 Tom Geens*	Ghent University, Belgium	CPs
2005 Marnix Van Loock*	Catholic University Leuven, Belgium	CPs
2005 Manuela Voorend*	Maastricht University, The Netherlands	CP
2005 Tryphon Vainas	Maastricht University, The Netherlands	CP
2004 H.F. Berg	University of Amsterdam, The Netherlands	CP
2004 Boulos Maraha*	VU Universtiy, Amsterdam, The Netherlands	CP
1997 Roel P.A.J. Verkooyen*	Erasmus University Rotterdam, The Netherlands	CP
1994 Daisy Vanrompay*	Belgium	CPs

Table IV: *Current PhD fellows working (partially) on* Chlamydiae.

Stefanie Lagae	Ghent University, Belgium	CPs
Kristien de Puysseleyr	Ghent University, Belgium	C
Leentje de Puysseleyr	Ghent University, Belgium	C
Sarah van Lent	Ghent University, Belgium	CPs
Cindy de Boeck	Ghent University, Belgium	CPs
Matthias van Gils	Ghent University, Belgium	C

**Chlamydiae* are the major focus in the thesis.
C: Chlamydiae
CAb: C. abortus
CT: C. trachomatis
CP: C. pneumoniae
CPs: C. psittaci

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Announcement

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