IMMUNOCHEMICAL INVESTIGATIONS OF CELL SURFACE ANTIGENS OF NEISSERIA MENINGITIDIS AND NEISSERIA GONORRHEA(U)
CALIFORNIA UNIV IRVINE COLL OF MEDICINE F A WYLE
UNCLASSIFIED APR 79 DADA17-72-C-2076

IMMUNOCHEMICAL INVESTIGATIONS OF CELL SURFACE ANTIGENS

OF NEISSERIA MENINGITIDIS AND NEISSERIA GONORRHEA

Final Report
April 1979

by

Frederic A. Wyle, M. D.

Supported by

US Army Medical Research and Development Command
Fort Detrick, Frederick, Maryland 21701

Contract No. DADA 17-72-C-2076

University of California School of Medicine
Irvine, California 92664

Approved for public release; distribution unlimited

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.
1. REPORT NUMBER
2. GOVT ACCESSION NO. A12241
3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)
   Immunochemical Investigations of Cell Surface Antigens of Neisseria meningitidis and Neisseria gonorrhoeae

5. TYPE OF REPORT & PERIOD COVERED
   Final Report
   1 Dec 1971 - 28 Feb 1975

6. PERFORMING ORG. REPORT NUMBER
   DADA 17-72-C-2076

7. AUTHORE(S)
   Frederic A. Wyle, M. D.

8. CONTRACT OR GRANT NUMBER(S)
   DADA 17-72-C-2076

9. PERFORMING ORGANIZATION NAME AND ADDRESS
   University of California School of Medicine
   Irvine, California 92664

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
    61102A
    3A161102ZB71Q.00.347

11. CONTROLLING OFFICE NAME AND ADDRESS
    US Army Medical Research and Development Command
    Fort Detrick, Frederick, Maryland 21701

12. REPORT DATE
    April 1979

13. NUMBER OF PAGES
    5 pages

14. MONITORING AGENCY NAME & ADDRESS (IF different from Controlling Office)

15. DISTRIBUTION STATEMENT (of this Report)
    Approved for public release; distribution unlimited

16. DISTRIBUTION STATEMENT (of the abstract entered in Block 29, if different from Report)

17. SUPPLEMENTARY NOTES

18. SECURITY CLASS. (of this report)
    Unclassified

19a. DECLASSIFICATION/DOWNGRADING SCHEDULE

20. KEYWORDS (Continue on reverse side if necessary and identify by block number)
    Neisseria gonorrhoeae
    Neisseria meningitidis
    Antigens
    Cell-mediated immunity

21. ABSTRACT (Continue on reverse side if necessary and identify by block number)
    Cell surface antigens of N. gonorrhoeae and N. meningitidis were isolated and purified. Antisera to these antigens were produced in rabbits and used to examine their species specificity. The cell mediated immune response in patients with clinical gonococcal infections were examined using these antigens. It was found that such patients have leukocyte transformation responses to both gonococcal and meningococcal antigens. Responses in female patients were found to be much greater than that of male patients.
Dear Sir:

The work outlined in this final report falls into three categories: (1) isolation, purification and chemical analysis of cell surface antigens of Neisseria gonorrhoeae and Neisseria meningitidis; (2) determination of the serological specificity of the cell surface antigens of N. gonorrhoeae and N. meningitidis; and (3) investigations into the cellular immune response of patients with uncomplicated gonorrhea to purified cell surface antigens of N. gonorrhoeae and N. meningitidis.

Isolation of N. gonorrhoeae and N. meningitidis cell surface antigens was accomplished via a modification of the RibT ether extraction technique. Partial purification of crude antigens was effected by ribonuclease and deoxyribonuclease treatment together with gel filtration chromatography. This procedure resulted in a two peak elution pattern which was virtually identical for the gonococcal and meningococcal antigens. Chemical analysis showed composition of the first peak to be primarily protein, while the second peak was largely nucleic acid. These purification steps were performed on numerous gonococcal and meningococcal strains stocked in the laboratory. Comparison of the antigenic structure of the outer membrane for these strains was carried out utilizing sodium dodecyl sulfate polyarylamide gel electrophoresis.

The antigens designated above were utilized to produce antisera in rabbits. The antisera were tested by immunodiffusion, countercurrent immunoelectrophoresis, and indirect hemagglutination techniques. These serological studies revealed extensive cross-reactivity between crude gonococcal and meningococcal antigenic preparations. Partial purification reduced the degree of cross-reactivity detected by the tests.

Peripheral blood lymphocytes (PBL) were isolated from blood samples obtained from patients with uncomplicated gonorrhea at either the Santa Ana Venereal Disease Clinic or the University of Southern California-Los Angeles County Medical Center Venereal Disease Clinic. PBL transformation stimulated by gonococcal and meningococcal antigens were utilized as a measure of cell-mediated immunity (CMI). Both male and female patients exhibited a broad range of blastogenic responses to gonococcal and meningococcal antigens. Control subjects demonstrated significantly lower and more uniform responses.
As a group, female patients displayed a greater CMI response than male patients. Cross-reactivity between N. gonorrhoeae and N. meningitidis was manifested by PBL transformation in patients with gonorrhea to non-purified menigococcal antigen. Partial purification of the menigococcal antigen by gel chromatography resulted in a reduced CMI response in both male and female patients. Female patients demonstrated marked stimulation with the purified gonococcal antigen, while male patients showed only slight stimulation. This study verified the lymphocyte transformation response in gonococcal infection. The functional role of CMI in gonococcal infection remains uncertain.

Sincerely,

FREDERIC A. WYLE, M.D.
Assistant Professor of Medicine