A PHASE I DOUBLE-BLIND TRIAL INVESTIGATING TRACHOMA VACCINE STRATEGIES USING THE CHLAMYDIA VACCINE CTH522 ADMINISTERED WITH CATIONIC LIPOSOMES IN HEALTHY ADULTS (CHLM-02)

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Background:
Protection against *C. trachomatis* involves induction of systemic and mucosal immunity in the eye against trachoma or genital tract against chlamydia. The vaccine candidate CTH522, a recombinant version of the major outer membrane molecule from *C. trachomatis,* induces neutralising antibodies and cellular immunity.

Methods:
CHLM-02 was a phase I, double-blind, randomised, placebo-controlled trial at the NIHR Imperial Clinical Research Facility, London, UK. We assigned trial participants into six arms (A-F). A-E received three intramuscular (IM) injections of CTH522 (Day 0, 28, and 112). A-D received CTH522-CAF®01 IM (85µg or 15µg). E received 85µg CTH522 with the new adjuvant CAF®09b. B and C received unadjuvanted CTH522 boost via the topical ocular (TO) or intradermal (ID) route, respectively, jointly with the 2nd and 3rd IM vaccinations. F received placebo. The effect of mucosal recall on eye immunity with TO CTH522 was assessed at Day 140.

Results:
Between Feb 17, 2020 and Feb 22, 2022, 154 subjects were screened, 65 randomised, and 60 completed the trial (52·3% women, 70·8% white, mean age 26·8 years). No serious adverse events occurred. Trial participants in arms with active IM vaccines had more injection site reactions than placebo; unadjuvanted CTH522 was safe when administered ID and TO. Serum IgG anti-CTH522 titres were higher in arms with 85µg CTH522-CAF®01 than with 15µg. ID CTH522 induced higher titres of serum IgG anti-CTH522 and neutralising antibodies. TO CTH522 induced significantly higher levels of ocular IgA when co-administered with IM CTH522. Participants in all active arms developed higher cell-mediated immune responses compared with placebo.

Conclusion:
CTH522, adjuvanted with either CAF®01 or CAF®09b, is safe and immunogenic. Systemic immune responses were enhanced by ID CTH522 boost, whereas ocular mucosal immune responses were enhanced by TO CTH522 boost. CTH522 holds promise for future testing in efficacy trials against urogenital chlamydia and trachoma.

Disclosure of Interest Statement:
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