The study listed may include approved and non-approved uses, formulations or treatment regimens. The results reported in any single study may not reflect the overall results obtained on studies of a product. Before prescribing any product mentioned in this Register, healthcare professionals should consult prescribing information for the product approved in their country.

Study No.: 103532 (MenACWY-TT-009)

Title: A phase II, partially blind, randomized, controlled, primary vaccination study to assess the immunogenicity, safety and reactogenicity of one intramuscular dose of four different formulations of GlaxoSmithKline (GSK) Biologicals' meningococcal serogroups A, C, W-135, Y-tetanus toxoid conjugate (MenACWY-TT) vaccine versus one subcutaneous dose of MENCEVAX™ ACWY in healthy adolescents/young adults aged 15-19 years.
MenACWY-TT: GSK Biologicals' meningococcal serogroups A, C, W-135, Y tetanus toxoid conjugate vaccine
Mencevax™ ACWY (MenACWY): GSK Biologicals' meningococcal serogroups A, C, W-135, Y plain polysaccharide vaccine

Rationale: The aim of this study was to evaluate the immunogenicity and safety of 4 different formulations of the MenACWY-TT conjugate vaccine as compared to the MenACWY vaccine, when given to healthy adolescents/young adults aged 15-19 years.

Phase: II

Study Period: 22 March 2005 to 01 July 2005

Study Design: Controlled, partially blinded*, randomized, single center study with 5 parallel groups (1:1:1:1:1).
Note: eligible subjects were stratified according to age (half of the subjects aged 15 through 17 years, the other half aged 18 through 19 years) and randomized (1:1:1:1:1) within each age stratum to 1 of the 5 parallel groups.
* Double-blind for F1, F2 and F3 groups; single-blind for F4 Group and open label for ACWY Group.

Centers: 1 study center in Belgium

Indication: Primary immunization of healthy adolescents/young adults against meningococcal disease due to *Neisseria meningitidis* of serogroups A, C, W-135 and Y.

Treatment: The study groups were as follows:
- F1 Group: subjects received 1 dose of MenACWY-TT formulation 1
- F2 Group: subjects received 1 dose of MenACWY-TT formulation 2
- F3 Group: subjects received 1 dose of MenACWY-TT formulation 3
- F4 Group: subjects received 1 dose of MenACWY-TT formulation 4
- ACWY Group: subjects received 1 dose of MenACWY.

MenACWY was administered subcutaneously into the non-dominant upper arm. MenACWY-TT vaccine was administered intramuscularly into the non-dominant deltoid.

Objectives: To evaluate the immune response induced by 4 different formulations of MenACWY-TT candidate conjugate vaccine versus MenACWY in healthy adolescents/young adults aged 15 through 19 years.

Primary Outcome/Efficacy Variable:
One month after the vaccination dose, in all subjects, percentage of responders† for:
- rSBA*-MenA
- rSBA-MenC
- rSBA-MenW-135
- rSBA-MenY

*rSBA: serum bactericidal assay using baby rabbit complement
†A responder was defined:
- For initially seropositive (i.e., pre-vaccination rSBA titers ≥1:8) subjects as a subject having ≥ a 4-fold increase in rSBA titer from pre- to post-vaccination
- For initially seronegative (i.e., pre-vaccination rSBA titers <1:8) subjects, as a subject having a post-vaccination antibody titer ≥ 1:32.

Secondary Outcome/Efficacy Variable(s):
Immunogenicity
Prior to and one month after the vaccine dose:
- rSBA-MenA, rSBA-MenC, rSBA-MenW-135 and rSBA-MenY titers ≥1:8
- rSBA-MenC titer ≥ 1:128
- rSBA-MenA, rSBA-MenC, rSBA-MenW-135 and rSBA-MenY titers
- Anti-polysaccharide (PS) A (anti-PSA), anti-PSC, anti-PSW-135, anti-PSY antibody concentrations
- Anti-PSA, anti-PSC, anti-PSW-135, anti-PSY antibody concentrations ≥ 0.3 μg/mL

- Anti-PSA, anti PSC antibody concentrations ≥ 2 μg/mL
- Anti-tetanus antibody concentrations ≥ 0.1 IU/mL (seroprotection) and concentration

Safety

- Occurrence of local and general solicited symptoms during the 8-day (Days 0-7) follow-up period following administration of each vaccine dose,
- Occurrence of unsolicited adverse events (AEs) during the 31-day (Days 0-30) follow-up period following administration of each vaccine dose,
- Occurrence of any serious adverse events (SAEs) throughout the study.

Statistical Methods:

The analyses were performed on the Total Vaccinated Cohort and the According-To-Protocol (ATP) cohort for immunogenicity.

-The Total Vaccinated Cohort included all vaccinated subjects for whom data were available.

-The ATP cohort for immunogenicity included all evaluable subjects (i.e. those meeting all eligibility criteria, complying with the procedures defined in the protocol, with no elimination criteria during the study) for whom immunogenicity data were available.

Analysis of immunogenicity:

The analysis of immunogenicity was performed on the ATP cohort for immunogenicity.

Vaccine response rates were calculated with exact 95% Confidence Intervals (CIs) for each vaccine antigen post vaccination. Pre- and post-vaccinated geometric mean concentrations (GMCs) or geometric mean titers (GMTs) with 95% CIs and the percentage of subjects with antibody concentrations or titers above the proposed cut-offs (seropositivity or seroprotection rates) with exact 95% CIs were calculated for each antibody.

Analysis of safety:

The analysis of safety was performed on the Total Vaccinated Cohort.

The incidence of each solicited local or general symptom reported during the 8-day (Days 0-7) follow-up period following vaccination was calculated with exact 95% CI. The same tabulation was performed for each Grade 3 solicited local and general symptom and for each solicited general symptom assessed by the investigators as causally related to vaccination. The percentage of subjects with at least one unsolicited AE reported during the 31-day (Days 0-30) follow-up period after vaccination was tabulated according to the Medical Dictionary for Regulatory Activities (MedDRA) preferred terms. SAEs were tabulated according to the MedDRA preferred terms throughout the entire study period.

Study Population: A male or female subject between, and including, 15 and 19 years of age at the time of the first vaccination, free of obvious health problems as established by medical history and clinical examination before entering into the study and who previously completed routine childhood vaccinations to the best of his/her knowledge and/or his/her parents'/legally acceptable representative's knowledge. If the subject was female and of childbearing potential, she was to be abstinent or have used adequate contraceptive precautions for 30 days prior to vaccination, to have a negative pregnancy test and to have agreed to continue such precautions for 2 months after the vaccination. Written informed consent was obtained from the subject prior to enrolment (for subjects below the legal age of consent, written informed consent was to be obtained from a parent or legally acceptable representative and, in addition, the subject was to sign and personally date a written informed assent).

Number of Subjects:	**F1 Group**	**F2 Group**	**F3 Group**	**F4 Group**	**ACWY Group**
Planned, N	25	25	25	25	25
Randomized, N (Total Vaccinated Cohort)	25	25	25	25	25
Completed, n (%)	25 (100)	25 (100)	25 (100)	24 (96.0)	25 (100)
Total Number Subjects Withdrawn, n (%)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)	0 (0.0)
Withdrawn due to Adverse Events, n (%)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)	0 (0.0)
Withdrawn due to Lack of Efficacy, n (%)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Withdrawn for other reasons, n (%)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Demographics	**F1 Group**	**F2 Group**	**F3 Group**	**F4 Group**	**ACWY Group**
N (Total Vaccinated Cohort)	25	25	25	25	25
Females: Males	13:12	13:12	15:10	14:11	15:10
Mean Age, years (SD)	17.2 (1.16)	17.0 (1.22)	17.4 (1.15)	17.3 (1.11)	17.2 (1.52)
White/Caucasian, n (%)	23 (92.0)	21 (84.0)	23 (92.0)	24 (96.0)	23 (92.0)

Primary Efficacy Results: Percentage of subjects with a vaccine response for rSBA antibodies one month after the

vaccine dose (ATP cohort for immunogenicity)							
Antibody	**Group**	**Pre-vaccination Status**	**N**	**Responders**			
				n	**%**	**95% CI**	
						LL	**UL**
rSBA-MenA	F1	S-	0	-	-	-	-
		S+	22	20	90.9	70.8	98.9
		Total	22	20	90.9	70.8	98.9
	F2	S-	1	1	100	2.5	100
		S+	19	14	73.7	48.8	90.9
		Total	20	15	75.0	50.9	91.3
	F3	S-	0	-	-	-	-
		S+	22	21	95.5	77.2	99.9
		Total	22	21	95.5	77.2	99.9
	F4	S-	1	1	100	2.5	100
		S+	23	15	65.2	42.7	83.6
		Total	24	16	66.7	44.7	84.4
	ACWY	S-	0	-	-	-	-
		S+	21	18	85.7	63.7	97.0
		Total	21	18	85.7	63.7	97.0
rSBA-MenC	F1	S-	4	4	100	39.8	100
		S+	19	12	63.2	38.4	83.7
		Total	23	16	69.6	47.1	86.8
	F2	S-	9	8	88.9	51.8	99.7
		S+	13	10	76.9	46.2	95.0
		Total	22	18	81.8	59.7	94.8
	F3	S-	5	5	100	47.8	100
		S+	17	13	76.5	50.1	93.2
		Total	22	18	81.8	59.7	94.8
	F4	S-	3	3	100	29.2	100
		S+	20	14	70.0	45.7	88.1
		Total	23	17	73.9	51.6	89.8
	ACWY	S-	7	7	100	59.0	100
		S+	15	13	86.7	59.5	98.3
		Total	22	20	90.9	70.8	98.9
rSBA-MenW-135	F1	S-	3	3	100	29.2	100
		S+	17	16	94.1	71.3	99.9
		Total	20	19	95.0	75.1	99.9
	F2	S-	4	4	100	39.8	100
		S+	16	13	81.3	54.4	96.0
		Total	20	17	85.0	62.1	96.8
	F3	S-	4	4	100	39.8	100
		S+	18	17	94.4	72.7	99.9
		Total	22	21	95.5	77.2	99.9
	F4	S-	2	2	100	15.8	100
		S+	20	19	95.0	75.1	99.9
		Total	22	21	95.5	77.2	99.9
	ACWY	S-	2	2	100	15.8	100
		S+	20	17	85.0	62.1	96.8
		Total	22	19	86.4	65.1	97.1
rSBA-MenY	F1	S-	0	-	-	-	-
		S+	23	21	91.3	72.0	98.9
		Total	23	21	91.3	72.0	98.9
	F2	S-	1	1	100	2.5	100
		S+	23	20	87.0	66.4	97.2
		Total	24	21	87.5	67.6	97.3

	F3	S-	3	3	100	29.2	100
		S+	22	17	77.3	54.6	92.2
		Total	25	20	80.0	59.3	93.2
	F4	S-	2	2	100	15.8	100
		S+	21	19	90.5	69.6	98.8
		Total	23	21	91.3	72.0	98.9
	ACWY	S-	2	2	100	15.8	100
		S+	22	20	90.9	70.8	98.9
		Total	24	22	91.7	73.0	99.0

N = number of subjects with pre- and post-vaccination results available
n (%) = number (percentage) of subjects with a vaccine response
S-/S+ = initially seronegative/seropositive subjects
Total = subjects either seropositive or seronegative at pre-vaccination
95% CI = exact 95% confidence interval; LL = Lower Limit, UL = Upper Limit

Secondary Outcome Variable (s): Percentage of subjects with rSBA titers ≥ 1:8 and ≥ 1:128 and GMT (ATP cohort for immunogenicity)

Antibody	Group	Timing	N	≥ 1:8				≥ 1:128				GMT		
				n	%	95% CI		n	%	95% CI		Value	95% CI	
						LL	UL			LL	UL		LL	UL
rSBA-MenA	F1	PRE	23	23	100	85.2	100	23	100	85.2	100	883.2	636.8	1224.9
		PI(M1)	22	22	100	84.6	100	22	100	84.6	100	9805.4	7612.2	12630.4
	F2	PRE	23	22	95.7	78.1	99.9	21	91.3	72.0	98.9	513.0	263.0	1000.7
		PI(M1)	21	21	100	83.9	100	21	100	83.9	100	8516.7	6306.5	11501.5
	F3	PRE	25	25	100	86.3	100	21	84.0	63.9	95.5	517.8	336.3	797.2
		PI(M1)	22	22	100	84.6	100	22	100	84.6	100	10290.4	7520.7	14080.1
	F4	PRE	24	23	95.8	78.9	99.9	22	91.7	73.0	99.0	649.4	337.7	1248.5
		PI(M1)	24	24	100	85.8	100	24	100	85.8	100	4335.2	3194.1	5883.9
	ACWY	PRE	24	24	100	85.8	100	24	100	85.8	100	821.0	579.9	1162.2
		PI(M1)	22	22	100	84.6	100	22	100	84.6	100	8021.9	6064.6	10610.9
rSBA-MenC	F1	PRE	23	19	82.6	61.2	95.0	13	56.5	34.5	76.8	153.9	57.5	411.8
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	3987.0	2299.8	6912.2
	F2	PRE	22	13	59.1	36.4	79.3	8	36.4	17.2	59.3	37.9	13.5	106.4
		PI(M1)	24	23	95.8	78.9	99.9	23	95.8	78.9	99.9	3524.1	1586.7	7827.3
	F3	PRE	22	17	77.3	54.6	92.2	7	31.8	13.9	54.9	61.9	23.3	164.0
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	3608.4	2283.4	5702.3
	F4	PRE	23	20	87.0	66.4	97.2	10	43.5	23.2	65.5	121.2	51.1	287.4
		PI(M1)	24	24	100	85.8	100	23	95.8	78.9	99.9	2391.1	1314.7	4348.7
	ACWY	PRE	22	15	68.2	45.1	86.1	10	45.5	24.4	67.8	91.4	27.3	306.1
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	5447.4	2924.3	10147.7
rSBA-MenW-135	F1	PRE	20	17	85.0	62.1	96.8	9	45.0	23.1	68.5	86.9	39.7	190.4
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	5418.4	3782.3	7762.3
	F2	PRE	20	16	80.0	56.3	94.3	11	55.0	31.5	76.9	90.0	37.9	213.7
		PI(M1)	24	24	100	85.8	100	24	100	85.8	100	4468.7	2762.3	7229.4
	F3	PRE	22	18	81.8	59.7	94.8	9	40.9	20.7	63.6	87.5	36.7	208.7
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	4257.1	3427.4	5287.6
	F4	PRE	22	20	90.9	70.8	98.9	12	54.5	32.2	75.6	123.7	66.3	230.8
		PI(M1)	24	24	100	85.8	100	24	100	85.8	100	4620.9	2901.1	7360.1
	ACWY	PRE	22	20	90.9	70.8	98.9	7	31.8	13.9	54.9	89.0	45.3	174.5
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	2713.9	1786.6	4122.3
rSBA-MenY	F1	PRE	23	23	100	85.2	100	19	82.6	61.2	95.0	288.6	163.7	508.7
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	7121.6	5119.5	9906.5
	F2	PRE	24	23	95.8	78.9	99.9	16	66.7	44.7	84.4	223.6	123.2	405.8
		PI(M1)	24	24	100	85.8	100	23	95.8	78.9	99.9	5754.7	3302.2	10028.8
	F3	PRE	25	22	88.0	68.8	97.5	19	76.0	54.9	90.6	215.1	91.9	503.3
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	5927.5	4436	7920.6

	F4	PRE	24	22	91.7	73.0	99.0	16	66.7	44.7	84.4	168.3	76.1	372.2
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	6742.2	4927.7	9224.9
	ACWY	PRE	24	22	91.7	73.0	99.0	16	66.7	44.7	84.4	203.2	102.0	404.7
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	4853.8	3227.8	7298.8

N = number of subjects with available results
n (%) = number (percentage) of subjects with titer ≥ the specified cut-off
95% CI = 95% confidence interval; LL = Lower Limit, UL = Upper Limit
PRE = Prior to the vaccine dose
PI(M1) = One month after the vaccine dose

Secondary Outcome Variable (s): Percentage of subjects with anti-PS antibody concentration ≥ 0.3 μg/mL and ≥ 2.0 μg/mL and GMCs (ATP cohort for immunogenicity)

Antibody	**Group**	**Timing**	**N**	**≥ 0.3 μg/mL**				**≥ 2.0 μg/mL**				**GMC (μg/mL)**		
				n	**%**	**95% CI**		**n**	**%**	**95% CI**		**Value**	**95% CI**	
						LL	**UL**			**LL**	**UL**		**LL**	**UL**
Anti-PSA	F1	PRE	22	9	40.9	20.7	63.6	0	0.0	0.0	15.4	0.28	0.19	0.39
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	20.38	12.13	34.26
	F2	PRE	23	14	60.9	38.5	80.3	4	17.4	5.0	38.8	0.60	0.32	1.13
		PI(M1)	24	24	100	85.8	100	24	100	85.8	100	29.50	14.83	58.69
	F3	PRE	24	16	66.7	44.7	84.4	6	25.0	9.8	46.7	0.74	0.40	1.37
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	47.83	25.51	89.70
	F4	PRE	24	12	50.0	29.1	70.9	3	12.5	2.7	32.4	0.43	0.25	0.75
		PI(M1)	24	23	95.8	78.9	99.9	18	75.0	53.3	90.2	5.46	2.78	10.72
	ACWY	PRE	25	11	44.0	24.4	65.1	3	12.0	2.5	31.2	0.37	0.21	0.65
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	27.39	15.92	47.13
Anti-PSC	F1	PRE	23	11	47.8	26.8	69.4	6	26.1	10.2	48.4	0.52	0.26	1.03
		PI(M1)	23	23	100	85.2	100	22	95.7	78.1	99.9	12.11	6.40	22.94
	F2	PRE	23	8	34.8	16.4	57.3	3	13.0	2.8	33.6	0.36	0.17	0.76
		PI(M1)	24	23	95.8	78.9	99.9	22	91.7	73.0	99.0	12.78	6.98	23.38
	F3	PRE	25	4	16.0	4.5	36.1	0	0.0	0.0	13.7	0.19	0.15	0.25
		PI(M1)	25	25	100	86.3	100	21	84.0	63.9	95.5	8.40	4.78	14.76
	F4	PRE	24	8	33.3	15.6	55.3	6	25.0	9.8	46.7	0.50	0.22	1.10
		PI(M1)	24	24	100	85.8	100	22	91.7	73.0	99.0	8.84	5.38	14.52
	ACWY	PRE	25	9	36.0	18.0	57.5	4	16.0	4.5	36.1	0.44	0.19	0.97
		PI(M1)	25	25	100	86.3	100	25	100	86.3	100	38.71	22.14	67.67
Anti-PSW-135	F1	PRE	23	3	13.0	2.8	33.6	1	4.3	0.1	21.9	0.19	0.14	0.26
		PI(M1)	23	23	100	85.2	100	19	82.6	61.2	95.0	9.65	4.61	20.19
	F2	PRE	23	8	34.8	16.4	57.3	2	8.7	1.1	28.0	0.27	0.18	0.40
		PI(M1)	24	24	100	85.8	100	20	83.3	62.6	95.3	14.55	7.26	29.15
	F3	PRE	25	5	20.0	6.8	40.7	2	8.0	1.0	26.0	0.25	0.15	0.40
		PI(M1)	25	25	100	86.3	100	19	76.0	54.9	90.6	6.39	3.65	11.20
	F4	PRE	24	5	20.8	7.1	42.2	3	12.5	2.7	32.4	0.24	0.15	0.37
		PI(M1)	23	22	95.7	78.1	99.9	20	87.0	66.4	97.2	10.70	4.90	23.36
	ACWY	PRE	25	4	16.0	4.5	36.1	2	8.0	1.0	26.0	0.21	0.14	0.32
		PI(M1)	25	25	100	86.3	100	23	92.0	74.0	99.0	13.57	7.13	25.84
Anti-PSY	F1	PRE	23	6	26.1	10.2	48.4	2	8.7	1.1	28.0	0.27	0.17	0.42
		PI(M1)	23	23	100	85.2	100	23	100	85.2	100	16.30	8.31	31.95
	F2	PRE	24	3	12.5	2.7	32.4	2	8.3	1.0	27.0	0.21	0.14	0.34
		PI(M1)	23	22	95.7	78.1	99.9	21	91.3	72.0	98.9	12.52	6.15	25.50
	F3	PRE	25	5	20.0	6.8	40.7	3	12.0	2.5	31.2	0.26	0.15	0.46
		PI(M1)	25	25	100	86.3	100	21	84.0	63.9	95.5	8.88	4.61	17.10
	F4	PRE	22	4	18.2	5.2	40.3	2	9.1	1.1	29.2	0.26	0.14	0.50
		PI(M1)	22	21	95.5	77.2	99.9	20	90.9	70.8	98.9	13.88	6.86	28.08
	ACWY	PRE	25	5	20.0	6.8	40.7	2	8.0	1.0	26.0	0.23	0.15	0.33
		PI(M1)	24	24	100	85.8	100	24	100	85.8	100	21.02	11.68	37.82

N = number of subjects with available results

n (%) = number (percentage) of subjects with antibody concentrations ≥ the specified cut-off
95% CI = 95% confidence interval; LL = Lower Limit, UL = Upper Limit
PRE = Prior to the vaccine dose
PI(M1) = One month after the vaccine dose

Secondary Outcome Variable (s): Seroprotection rates and GMCs for anti-tetanus antibodies (ATP cohort for immunogenicity)

Group	Timing	N	≥ 0.1 IU/mL				GMC (IU/mL)		
			n	%	95% CI		Value	95% CI	
					LL	UL		LL	UL
F1	PRE	23	22	95.7	78.1	99.9	3.770	1.913	7.429
	PI(M1)	23	23	100	85.2	100	18.733	14.135	24.828
F2	PRE	24	23	95.8	78.9	99.9	1.745	0.891	3.414
	PI(M1)	24	24	100	85.8	100	16.534	10.856	25.182
F3	PRE	25	24	96.0	79.6	99.9	2.555	1.436	4.545
	PI(M1)	25	25	100	86.3	100	14.156	9.570	20.938
F4	PRE	24	24	100	85.8	100	1.658	0.871	3.154
	PI(M1)	24	24	100	85.8	100	13.319	9.580	18.518
ACWY	PRE	25	23	92.0	74.0	99.0	1.432	0.751	2.733
	PI(M1)	25	24	96.0	79.6	99.9	1.575	0.864	2.871

N = number of subjects with available results
n (%) = number (percentage) of subjects with antibody concentrations ≥ the specified cut-off
95% CI = 95% confidence interval; LL = Lower Limit, UL = Upper Limit
PRE = Prior to the vaccine dose
PI(M1) = One month after the vaccine dose

Secondary Outcome Variable (s): Incidence of solicited local symptoms during the 8-day (Days 0-7) follow-up period after vaccine administration (Total Vaccinated Cohort)

Symptom	Intensity	F1 Group (N = 24)				F2 Group (N = 24)				F3 Group (N = 25)			
		n	%	95% CI		n	%	95% CI		n	%	95% CI	
				LL	UL			LL	UL			LL	UL
Pain	Any	15	62.5	40.6	81.2	14	58.3	36.6	77.9	19	76.0	54.9	90.6
	Grade 3	1	4.2	0.1	21.1	0	0.0	0.0	14.2	3	12.0	2.5	31.2
Redness	Any	9	37.5	18.8	59.4	6	25.0	9.8	46.7	7	28.0	12.1	49.4
	>50 mm	1	4.2	0.1	21.1	1	4.2	0.1	21.1	2	8.0	1.0	26.0
Swelling	Any	6	25.0	9.8	46.7	4	16.7	4.7	37.4	3	12.0	2.5	31.2
	>50 mm	2	8.3	1.0	27.0	0	0.0	0.0	14.2	0	0.0	0.0	13.7

Symptom	Intensity	F4 Group (N = 23)				ACWY Group (N = 25)			
		n	%	95% CI		n	%	95% CI	
				LL	UL			LL	UL
Pain	Any	18	78.3	56.3	92.5	18	72.0	50.6	87.9
	Grade 3	1	4.3	0.1	21.9	0	0.0	0.0	13.7
Redness	Any	7	30.4	13.2	52.9	6	24.0	9.4	45.1
	>50 mm	2	8.7	1.1	28.0	2	8.0	1.0	26.0
Swelling	Any	8	34.8	16.4	57.3	2	8.0	1.0	26.0
	>50 mm	2	8.7	1.1	28.0	0	0.0	0.0	13.7

N = number of subjects with the documented dose
n (%) = number (percentage) of subjects reporting the symptom at least once
95%CI = Exact 95% confidence interval; LL = Lower Limit, UL = Upper Limit
Any symptom = any report of the specified symptom irrespective of intensity grade
Grade 3 pain = pain that prevented normal activity

Secondary Outcome Variable (s): Incidence of solicited general symptoms during the 8-day (Days 0-7) follow-up period after vaccine administration (Total Vaccinated Cohort)

Symptom	Intensity/ Relation-ship	F1 Group (N = 24)				F2 Group (N = 24)				F3 Group (N = 25)			
		n	%	95% CI		n	%	95% CI		n	%	95% CI	
				LL	UL			LL	UL			LL	UL
Fatigue	Any	14	58.3	36.6	77.9	9	37.5	18.8	59.4	13	52.0	31.3	72.2

	Grade 3	0	0.0	0.0	14.2	0	0.0	0.0	14.2	1	4.0	0.1	20.4
	Related	2	8.3	1.0	27.0	1	4.2	0.1	21.1	2	8.0	1.0	26.0
Fever (Axillary Temperature)	≥ 37.5°C	2	8.3	1.0	27.0	1	4.2	0.1	21.1	4	16.0	4.5	36.1
	> 39.5°C	0	0.0	0.0	14.2	0	0.0	0.0	14.2	0	0.0	0.0	13.7
	Related	1	4.2	0.1	21.1	0	0.0	0.0	14.2	2	8.0	1.0	26.0
Gastrointestinal	Any	6	25.0	9.8	46.7	5	20.8	7.1	42.2	4	16.0	4.5	36.1
	Grade 3	0	0.0	0.0	14.2	0	0.0	0.0	14.2	0	0.0	0.0	13.7
	Related	0	0.0	0.0	14.2	0	0.0	0.0	14.2	0	0.0	0.0	13.7
Headache	Any	11	45.8	25.6	67.2	7	29.2	12.6	51.1	14	56.0	34.9	75.6
	Grade 3	1	4.2	0.1	21.1	2	8.3	1.0	27.0	1	4.0	0.1	20.4
	Related	2	8.3	1.0	27.0	2	8.3	1.0	27.0	4	16.0	4.5	36.1

Symptom	**Intensity/ Relation-ship**	**F4 Group (N = 23)**				**ACWY Group (N = 25)**			
		n	**%**	**95% CI**		**n**	**%**	**95% CI**	
				LL	**UL**			**LL**	**UL**
Fatigue	Any	12	52.2	30.6	73.2	9	36.0	18.0	57.5
	Grade 3	1	4.3	0.1	21.9	0	0.0	0.0	13.7
	Related	5	21.7	7.5	43.7	1	4.0	0.1	20.4
Fever (Axillary Temperature)	≥ 37.5°C	3	13.0	2.8	33.6	1	4.0	0.1	20.4
	> 39.5°C	0	0.0	0.0	14.8	0	0.0	0.0	13.7
	Related	1	4.3	0.1	21.9	0	0.0	0.0	13.7
Gastrointestinal	Any	4	17.4	5.0	38.8	3	12.0	2.5	31.2
	Grade 3	0	0.0	0.0	14.8	0	0.0	0.0	13.7
	Related	1	4.3	0.1	21.9	0	0.0	0.0	13.7
Headache	Any	10	43.5	23.2	65.5	10	40.0	21.1	61.3
	Grade 3	1	4.3	0.1	21.9	0	0.0	0.0	13.7
	Related	2	8.7	1.1	28.0	0	0.0	0.0	13.7

N = number of subjects with the documented dose
n (%) = number (percentage) of subjects reporting the symptom at least once
95%CI = Exact 95% confidence interval; LL = Lower Limit, UL = Upper Limit
Any = all reports of the specified symptom irrespective of intensity grade and relationship to vaccination
Grade 3 symptom = symptom that prevented normal activity
Related = symptoms assessed by the investigator as causally related to vaccination

Safety Results: Number (%) of subjects with unsolicited adverse events (Total Vaccinated Cohort)

Most frequent adverse events - On-Therapy (occurring within Days 0-30 following vaccination)	**F1 Group N = 25**	**F2 Group N = 25**	**F3 Group N = 25**	**F4 Group N = 25**	**ACWY Group N = 25**
Subjects with any AE(s), n (%)	7 (28.0)	8 (32.0)	12 (48.0)	8 (32.0)	7 (28.0)
Angina pectoris	-	-	-	-	1 (4.0)
Sickle cell anaemia	-	-	-	1 (4.0)	-
Vertigo	-	-	2 (8.0)	-	-
Conjunctivitis	-	-	-	-	2 (8.0)
Colitis	-	1 (4.0)	-	-	-
Diarrhoea	-	1 (4.0)	-	-	-
Toothache	-	-	1 (4.0)	-	-
Asthenia	-	-	-	1 (4.0)	-
Axillary pain	-	-	-	1 (4.0)	-
Influenza like illness	-	1 (4.0)	-	-	-
Injection site haemorrhage	-	-	1 (4.0)	-	-
Injection site pruritus	1 (4.0)	-	-	-	-
Injection site warmth	1 (4.0)	-	-	-	-
Venipuncture site pain	-	-	1 (4.0)	-	-
Onychomycosis	-	1 (4.0)	-	-	-
Pharyngitis	1 (4.0)	1 (4.0)	-	1 (4.0)	-
Rhinitis	1 (4.0)	1 (4.0)	-	-	1 (4.0)
Sinusitis	1 (4.0)	-	-	-	-

Tinea versicolour	-	-	-	1 (4.0)	-
Vaginal mycosis	-	-	-	1 (4.0)	-
Blood pressure decreased	-	-	1 (4.0)	-	-
Anorexia	-	-	1 (4.0)	-	-
Back pain	-	-	1 (4.0)	-	1 (4.0)
Muscle contracture	-	-	-	-	2 (8.0)
Muscle spasms	-	1 (4.0)	-	-	-
Myalgia	-	1 (4.0)	1 (4.0)	-	1 (4.0)
Pain in extremity	1 (4.0)	-	1 (4.0)	1 (4.0)	-
Sensation of heaviness	-	1 (4.0)	-	-	-
Tendonitis	1 (4.0)	-	-	-	-
Dizziness	-	-	-	1 (4.0)	-
Dysaesthesia	-	-	-	-	1 (4.0)
Headache	1 (4.0)	-	-	-	1 (4.0)
Migraine	1 (4.0)	-	-	-	-
Depression	-	-	1 (4.0)	-	-
Cough	1 (4.0)	-	-	-	-
Pharyngolaryngeal pain	1 (4.0)	1 (4.0)	1 (4.0)	1 (4.0)	-
Rhinitis allergic	1 (4.0)	1 (4.0)	-	1 (4.0)	-
Acne	-	-	1 (4.0)	-	-
Erythema	1 (4.0)	-	-	-	-
Pruritus	-	-	-	1 (4.0)	-
Urticaria	-	1 (4.0)	-	-	-
Hypotension	-	-	-	-	1 (4.0)
- : AE absent					
Safety Results: Number (%) of subjects with Serious Adverse Events (SAEs) (Total Vaccinated Cohort)					
Serious adverse event, n (%) [n considered by the investigator to be related to study medication]					
All SAEs	**F1 Group N = 25**	**F2 Group N = 25**	**F3 Group N = 25**	**F4 Group N = 25**	**ACWY Group N = 25**
Subjects with any SAE(s), n (%) [n assessed by the investigator as related]	0 (0.0) [0]	0 (0.0) [0]	0 (0.0) [0]	1 (4.0) [0]	0 (0.0) [0]
Sickle cell anemia	0 (0.0) [0]	0 (0.0) [0]	0 (0.0) [0]	1 (4.0) [0]	0 (0.0) [0]
Fatal SAEs	**F1 Group N = 25**	**F2 Group N = 25**	**F3 Group N = 25**	**F4 Group N = 25**	**ACWY Group N = 25**
Subjects with fatal SAE(s), n (%) [n assessed by the investigator as related]	0 (0.0) [0]	0 (0.0) [0]	0 (0.0) [0]	0 (0.0) [0]	0 (0.0) [0]

Conclusion:

One month after the vaccine administration, the percentage of responders for rSBA-MenA, rSBA-MenC, rSBA-MenW-135 and rSBA-MenY, respectively, were at least 66.7%, 69.6%, 85.0% and 80.0% across all the F groups and were 85.7%, 90.9%, 86.4% and 91.7% in the ACWY Group.

Within 30 days following vaccination, unsolicited AEs were reported for 7 (28.0%), 8 (32.0%), 12 (48.0%), 8 (32.0%) and 7 (28.0%) subjects in F1, F2, F3, F4 and ACWY groups, respectively.

One SAE was reported in F4 Group; it was considered by the investigator as not related to the study vaccination. No fatal SAEs were reported during this study.

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