

Background: *Streptococcus agalactiae* is the main cause of neonatal meningitis and can cause septicaemia and pneumonia. It colonises the vagina in about 20-30% of pregnant women and can be transmitted from mother to baby before or during labour. Nearly 10% of infected babies do not survive and those who recover may be left with permanent conditions. In order to prevent neonatal infection antibiotics can be given to women during labour or to babies after birth. These women can be identified by microbiological screening, involving taking a swab from the vagina or rectum. The use of a selective broth proved to increase the method selectivity by 60-90%.

Aims: The purpose of this study was to evaluate the new Sigma GBS™ selective medium with clinical isolates of *Streptococcus agalactiae* collected from pregnant women. The medium aims to maintain or increase the number of *S. agalactiae*, while inhibiting the numbers of other bacteria under the same conditions.

Materials/method: Sigma GBS™ was tested with 20 clinical isolates of GBS in order to assess the enrichment abilities of the medium. The medium was also tested for its ability to inhibit *E. coli*. 10⁵ cfu/ml concentrations of *Streptococcus agalactiae* and *E. coli* were prepared and media were inoculated in triplicate. Samples were tested at time zero and after 24h incubation at 37°C and RT. Colonies were counted after incubation and compared against time zero samples.

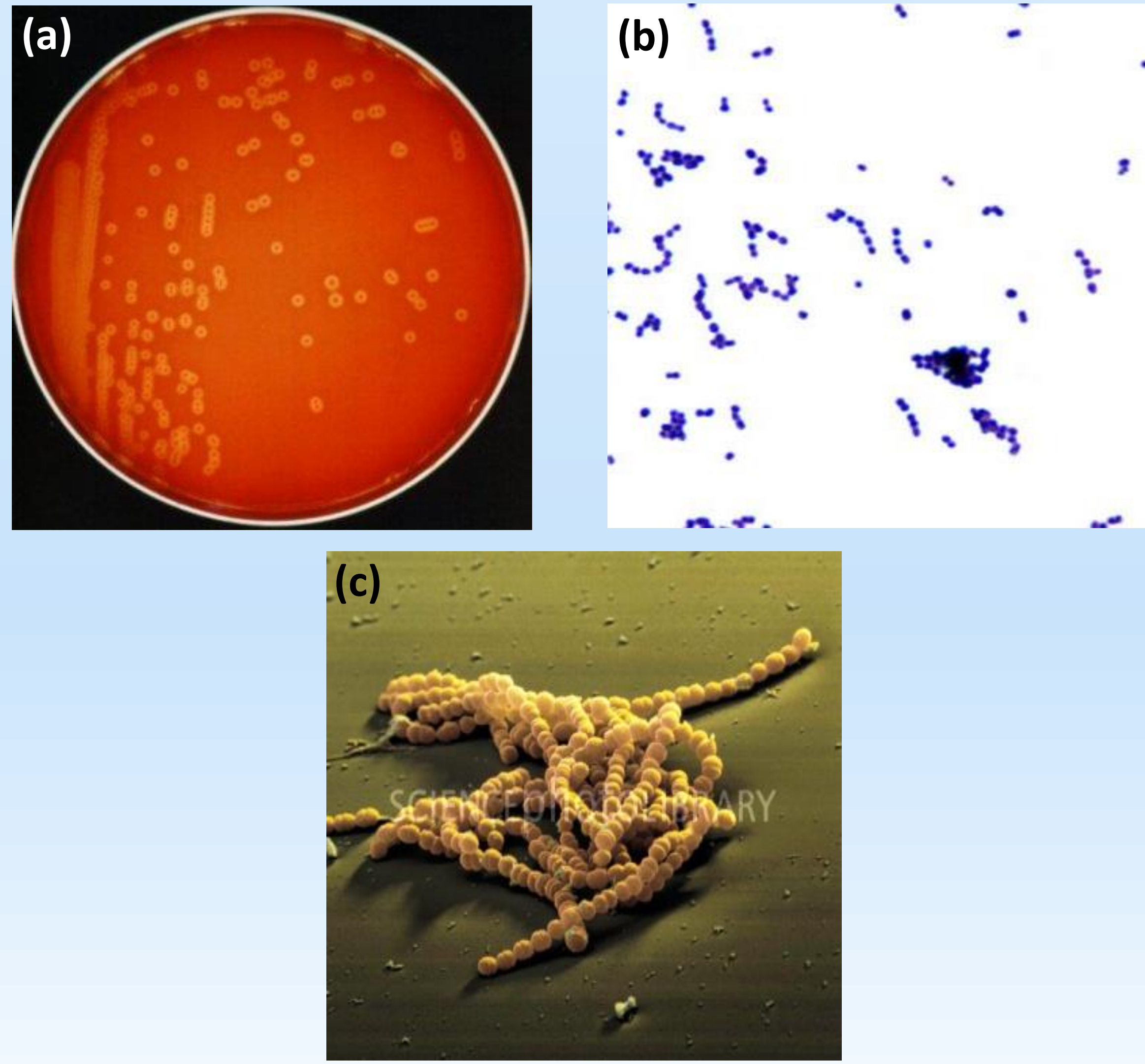


Figure 1. Images of (a) *Streptococcus agalactiae* on blood agar. (b) Gram Stain of *Streptococcus agalactiae* (c) *Streptococcus agalactiae* under Transmission electron microscope.

References:

1. Prevention of Group B Strep infection in neonates: The Way Forward in the UK. Conference report. Group B Strep Support (2015)
2. UK National Screening Committee.UK NSC Group B Streptococcus (GBS) Recommendation London: UK NSC; 2017.
3. Schrang S, Gorwitz R, Fultz-Butts K, Schuchat A (2002). Prevention of perinatal group B streptococcal disease. MMWR. Morbidity and Mortality Weekly Report 51(4).
4. Allen VM, Yudin MH, Bouchard C, Boucher M, Castillo E, Money DM, Murphy KE, Ogilvie G, Paguet C, van Schalkwyk J, Senikas V (2012). Management of group B streptococcal bacteriuria in pregnancy. J Obstet Gynaecol Can. 34(5): 482-486.
5. Money D, Allen VM (2013) the prevention of early-onset neonatal group B streptococcal disease. J Obstet Gynaecol Can. 35(10): 939-951.

Results: Sigma GBS™ successfully increased the numbers of all 20 strains of *Streptococcus agalactiae*, while completely inhibiting any growth of *E. coli*. Thus following incubation, these samples will provide optimum inocula for correct diagnosis of Group B Streptococcus carriage.

Table 1. Results of *E.coli* inhibition from Sigma GBS™, incubated at RT - Room Temp. and 37°C.

Escherichia coli inhibition		
Conditions	0h	24h
RT	183	No growth
37°C	116 198	No growth No growth

Table 2. Recovery/enrichment of *Streptococcus agalactiae* strains with Sigma GBS™, incubated at RT - Room Temp. and 37°C. TNTC – Too numerous to count.

Clinical strain	Conditions	Sigma GBS™		Clinical strain	Conditions	Sigma GBS™	
		0h	24h			0h	24h
1	RT	8, 12, 11	22, 21, 28	11	RT	36, 18, 23	21, 54, 41
	37°C		TNTC		37°C		TNTC
2	RT	6, 8, 7	10, 11, 8	12	RT	39, 109, 88	9, 48, 152
	37°C		TNTC		37°C		TNTC
3	RT	4, 2, 3	5, 8, 10	13	RT	188, 165, 146	71, 53, 115
	37°C		TNTC		37°C		TNTC
4	RT	4, 4, 2	1, 2, 0	14	RT	111, 128, 93	13, 18, 25
	37°C		TNTC		37°C		TNTC
5	RT	12, 12, 10	6, 2, 3	15	RT	84, 58, 51	4, 5, 2
	37°C		TNTC		37°C		TNTC
6	RT	5, 9, 2	2, 3, 1	16	RT	66, 68, 41	8, 16, 8
	37°C		TNTC		37°C		TNTC
7	RT	17, 28, 22	0, 4, 8	17	RT	12, 28, 7	0, 3, 8
	37°C		TNTC		37°C		TNTC
8	RT	11, 11, 18	12, 14, 15	18	RT	110, 98, 81	5, 3, 4
	37°C		TNTC		37°C		TNTC
9	RT	18, 21, 8	21, 18, 18	19	RT	13, 12, 32	2, 2, 1
	37°C		TNTC		37°C		TNTC
10	RT	14, 15, 21	19, 21, 25	20	RT	71, 52, 48	5, 2, 6
	37°C		TNTC		37°C		TNTC

Conclusions: Many countries introduced screening programmes and as a result of this the number of GBS infections in newborn babies has fallen significantly (around 80% on average). However in some European countries, routine screening for GBS is not offered and the incidence is increasing. When direct agar plating is used instead of selective enrichment broth, as many as 50% of women who are GBS positive have false negative culture results. Sigma GBS™ is a transport device able to maintain and increase (at RT and 37°C) the number of *S. agalactiae* and inhibit other bacteria, which increases the sensitivity of the GBS screening and therefore improves outcomes for mother and baby.