Interest of use in routine of **CHROMagar™ MRSA** medium for detection of Methicillin Resistant *Staphylococcus aureus* carriers in intensive care unit [(a)].

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Introduction Nasal carriage of Methicillin Resistant *Staphylococcus aureus* (MRSA) in hospitalized patients is a source of bacteriema and infections of surgical site. It is also a factor, known to be responsible for dissemination of MRSA in hospital. A rapid screening of incoming patients in Intensive Care Units (ICU) is recommended in order to take proper measures as soon as possible (1). Use of selective media have been suggested to detect MRSA carriers. We have tested in routine a new medium designated CHROMagar™ MRSA allowing detection of carriers in 24 hours.

Materials and methods

Patients : From 01-Jan-2003 to 01-Oct-2003 all patients hospitalised in ICU of CHU Brest (Univertsity Hopsital Center) a medical intensive care unit, 12 beds, 2 surgical intensive care units, 10 & 8 beds have been included. Swabs from nasal cavity (2 swabs) were taken during the admission in the unit and once a week during the stay.

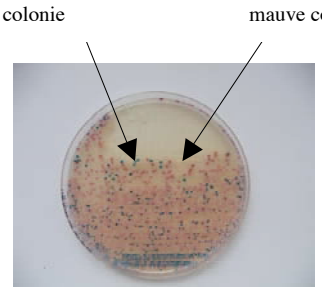
CHROMagar media: CHROMagar Staph aureus (CA) is a new chromogenic medium comercialized by CHROMagar, Paris, France allowing detection of *Staphylococcus aureus* (Sa). **CHROMagar™ MRSA** (CAMR) is constituted by CA medium supplemented by CHROMagar™ MRSA supplement allowing selection and detection of MRSA. Sa colonies appear as mauve colonies in both medium. Agglutination tests can be done directly from CHROMagar media.

Plating and analysis One swab is isolated on blood agar and on CA. The second swab is isolated on CAMR. We have chosen to not use an enrichment step in broth. Plates are incubated at 37°C and read at 24 and 48 hours. Identification tests are made on all suspected colonies : Gram colouration, catalase, agglutination tests (STAPH AUREUS, Fumouze) and coagulase detection if needed. An antibiotic susceptibility test is done by disk diffusion method according to CA-SFM recommendations (Antibiogramme Comitte, Société Française de Microbiologie) on all identified Sa strains. In case of doubt, the MRSA screen agglutination test (bioMerieux) was made.

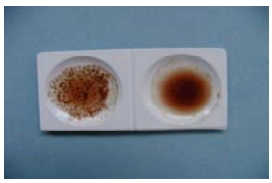
Results : 608 patients have been tested and 1486 swabs examined (from 1 to 13 per patient). 214 Sa carriers (35%) have been detected, 165 (27%) from admission. 45 patients were MRSA carriers (7.5%), 26 since admission (4.5%). 391 swabs were positive for Sa. All have been detected on blood agar. Sensitivity has been defined according to this reference.

Culture on CA and CAMR of methicillin susceptible *S.aureus* (MSSA) and MRSA (+) positive culture & (-) negative culture

	MSSA (n=300)		MRSA (n=91)	
	CA+	CA-	CA+	CA-
CAMR +	0	0	88	1
CAMR -	300	0	2	0



Polymicrobial sample including MRSA



Agglutination test from an MRSA colonie isolated from CAMR

Agglutination tests have been performed from MRSA colonies directly from CAMR and showed no difficulties for reading. Incubation for 48 hours has shown no superiority. Apart from Sa the only colonies that appear pinkish on CAMR were *Corynebacterium* or yeasts. They were pinpoint after 24 hours et could not be confused with Sa by an experimented technician. Gram colouration allowed to décide at low cost.

Discussion CAMR medium is proved to be efficient for isolation of MRSA with a sensitivity of 98%. For the 2 MRSA positives swabs on non selective medium that did no grow on CAMR, numeration of colonies on blood agar and CA was < 5. After repiquage those strains grew correctly on CAMR. The problem was probably due to a low inoculum.

No MSSA strain grew on this medium (Specificity = 100%). According to bibliography nobody has tested CA medium with the commercial supplement provided by CHROMagar. Two studies have reported problems of sensitivity with CA medium supplemented with 4mg/l of oxacillin (2, 3). The supplemented of CAMR is different (despite it is not described by the manufacturer) and performs so that the medium has a very good sensitivity and a very good specificity.

In consequence, from now on we detect MRSA directly from CAMR and we confirm the *S.aureus* species by simple tests.

Conclusion **CHROMagar™ MRSA** medium is interesting for use in routine screening of MRSA carriers in ICU. After 24 hours, with only few complementary tests (Gram colouration, catalase, agglutination) an answer can be transmitted to hospital department allowing the specialists to take proper decisions.

(a) translated from French to English

1 Lucet JC, Chevret S, Durand-Zaleski I et al. Prevalence and risk factors for carriage os *Staphylococcus aureus* methicillin resistantat admission in ICU. Arch Inter Med,2003;163:181-8

2 Merlino J, Leroi M, Bradbury R et al. New chromogenic identification and detection of *Staphylococcus aureus* and methicilline resistant *S.aureus*. J Clin Microbiol,2000;38:2378-80

3 Kluytmans J, Van Griethuysen A, Willemse P, Van Keulen P. Performance of CHROMagar selective medium and Oxacillin Resistance Screening Agar Base for identifying *Staphylococcus aureus* and detecting methicillin resistance. J Clin Microbiol,2002;40:2480-82