

Determinants of time to sputum smear conversion (TSSC) during lung tuberculosis therapy in a French cohort

Octave MASUT¹, Sandrine BOISSET², Olivier EPAULARD³

¹Department of Bacteriology - Grenoble University Hospital, Grenoble, France.

²Department of Bacteriology - Grenoble University Hospital, Grenoble, France.

³Department of Infectious Diseases - Grenoble University Hospital, Grenoble, France

Contact : OEpaulard@chu-grenoble.fr

I - Objectives

The infectivity of patients with active lung tuberculosis (TB) is linked to bacterial load in sputum. Such patients are usually maintained in isolation room until the initiation of anti-mycobacterial therapy and sputum smear conversion. The time to sputum smear conversion (TSSC) is highly variable; unforeseen long-term persistence of positive sputum smear may lead to a suspicion of absorption issues, resistance, or poor compliance, and a prolonged respiratory isolation time may be poorly tolerated by patients.

We aimed to determine the factors associated with delayed sputum conversion in patients with pulmonary TB after anti-TB treatment introduction.

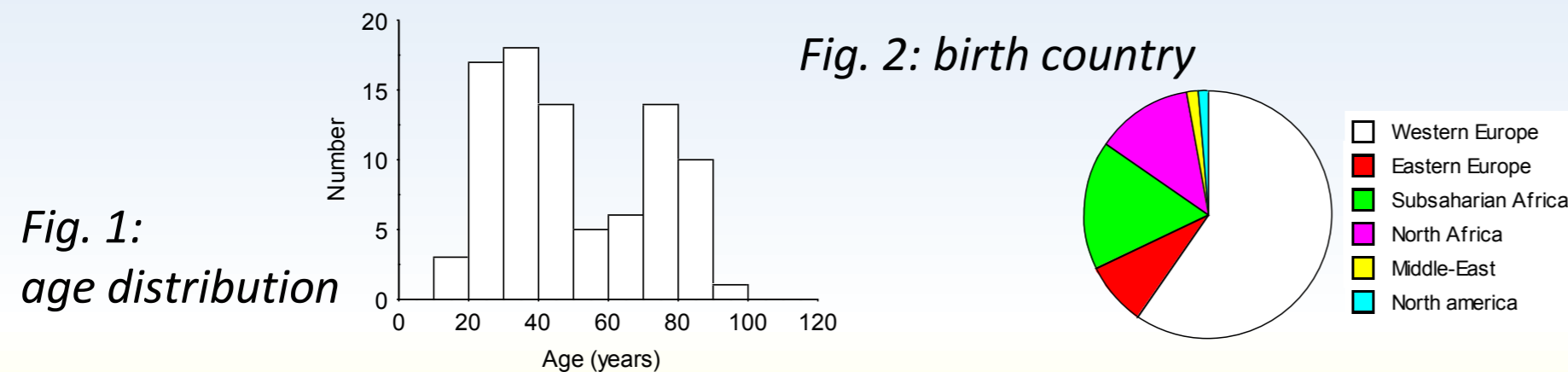
II - Methods

All adult patients with sputum culture-proven pulmonary TB referred to our institution (University Hospital of Grenoble) between 1998 and 2013 were retrospectively reviewed. Patients with an initial sputum smear positive (Ziehl-Nielsen staining) and a sputum smear follow-up during anti-mycobacterial therapy were included.

Log-rank test was performed.

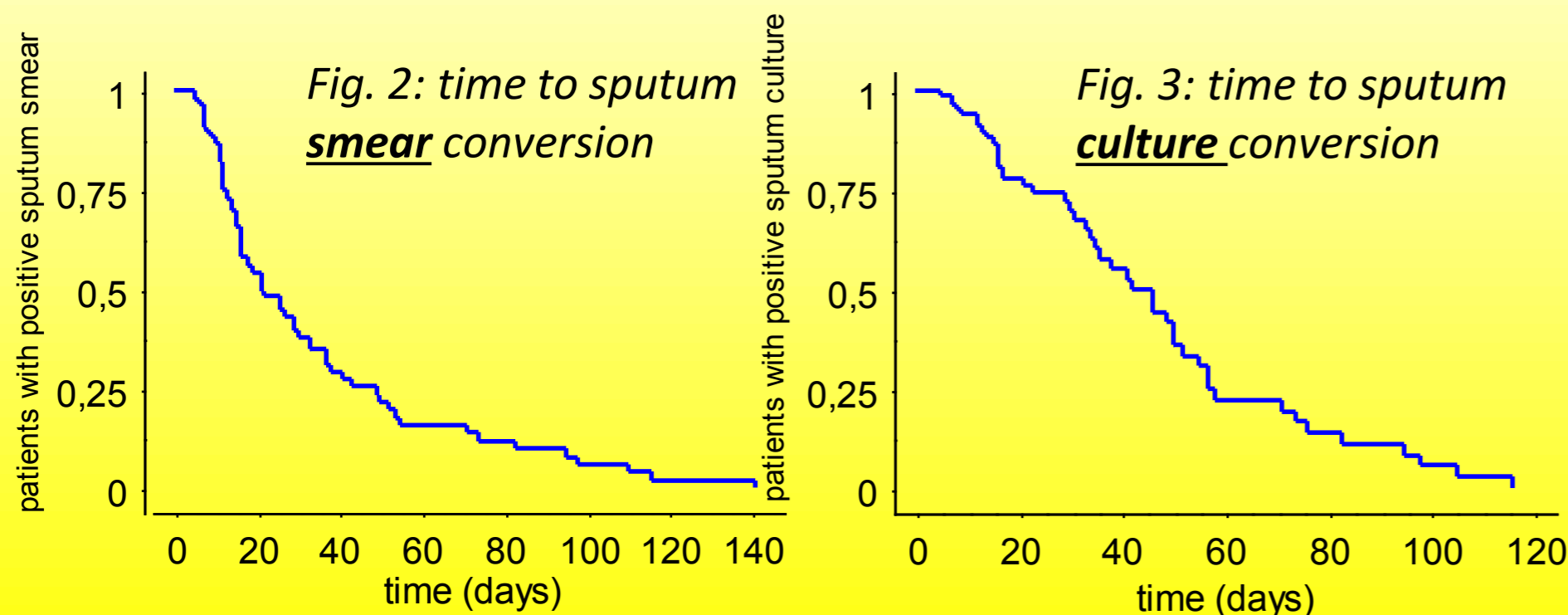
III - Results

Eighty-eight patients were included (mean 49+/-22years, 29 females and 59 males) (fig. 1). Most of them were born in Western Europe (fig. 2)



The median time to sputum smear conversion was 21 days (5 to 141 days); 15 patients had a TSSC of more than 40 days (fig.2).

The median time to sputum culture conversion was 42 days (5 to 116 days); 21 patients had a median time of more than 40 days (fig. 3).



In univariate analysis, the number of infected lung lobes was statistically associated with prolonged TSSC; a trend was noted for an association between prolonged TSSC and a body mass index <20, diabetes, lung cavern, and initial quantity of acid-fast bacilli (table 1).

Table 1		Sputum smear negativation	p	Sputum culture negativation	p
Age	<60	24	0.875	42	0.63
	>60	19		36	
Sex	masc.	21	0.302	47	0.166
	fem.	21		33	
BMI	<20	21	0.108	46	0.135
	>20	13		29	
Born in France	yes	22	0.154	43	0.281
	no	17		39	
Tobacco use	yes	20	0.809	43	0.212
	no	20		36	
Diabetes	yes	41	0.147	52	0.071
	no	18		36	
Cavern	yes	28	0.172	41	0.984
	no	15		35	
Infection >> 3 lung lobes	<3	17	0.005	37	0.222
	≥3	35		47	
Unilateral or bilateral	unilateral	15	0.362	29	0.008
	bilateral	26		43	
Quantity of AFB	OMS cat ≤2	12	0.144	29	0.026
	OMS cat ≥3	27		45	
Initial therapy	tritherapy	21	0.993	49	0.847
	quadritherapy	23		39	
immunocompromised	yes	18	0.881	34	0.841
	no	19		42	

IV - Conclusions

Physician and patients must expect a median TSSC of 21 days. A multilobar disease, a body mass index <20, diabetes, lung cavern, and abundant acid-fast bacilli on the initial sputum may be associated with a prolonged TSSC.