

# Antibiotic treatment of leprosy

Paul Sanderson, MD, MRCP  
Medical Director,  
American Leprosy Missions

ESGMYC Course. Wednesday, May 29<sup>th</sup>, 2013

# Antibiotic treatment of leprosy

- Current treatment regimens for leprosy
- Outcomes: cure, persisters and relapse
- Brief history of current drug regimens
- Other drugs active against *M leprae*
- Characteristics of anti-leprosy drugs
- Adverse effects of anti-leprosy drugs
- Alternative regimens for leprosy

# Current treatment:

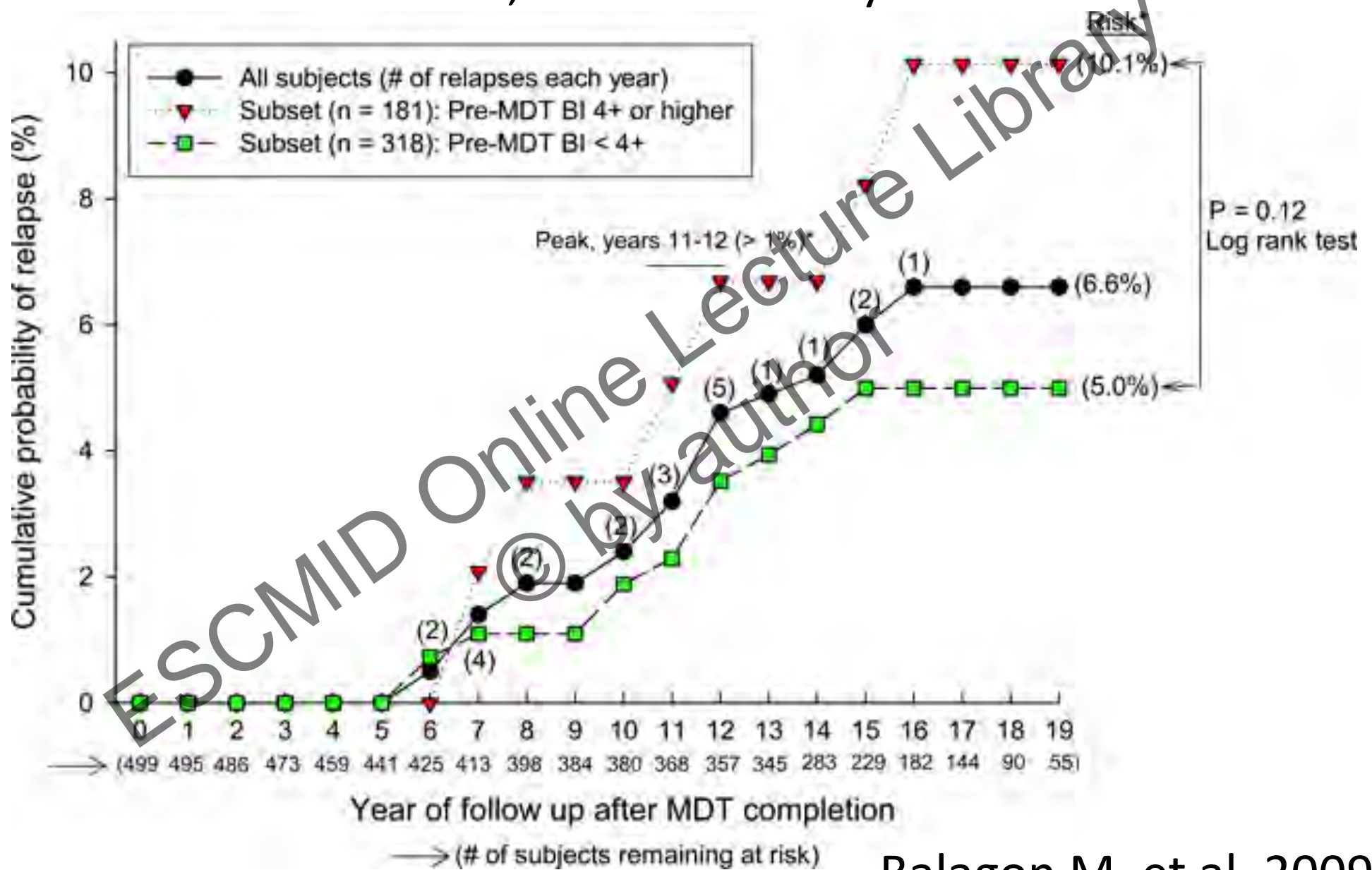
Global requirement donated by Novartis, since late 1990s

- Classification into PB and MB groups
- PB treatment lasts for 6 months:
  - Rifampicin 600 mg once monthly (supervised)
  - Dapsone 100 mg daily
- MB treatment lasts for 12 months:
  - Rifampicin 600 mg once monthly (supervised)
  - Dapsone 100 mg daily
  - Clofazimine 300 mg once monthly (supervised)  
plus 50 mg daily

# Outcomes

- Cure vs treatment completion
- Persisters
- Relapse vs reinfection
  - Definition of MB relapse:
    - New skin lesions, and
    - Increase in BI of 2 log units at any point
  - Reinfection can only be shown through strain-typing

# 500 MB cases in Cebu, treated with 2 years MDT



Balagon M, et al, 2009

# Brief history of current drugs

- Dapsone (4,4'-diaminodiphenylsulfone, or DDS)
  - Known to chemists in Germany from 1906
  - Found to be effective against leprosy in the 1940s
  - Used as monotherapy for decades
  - Drug resistance appeared in the 1950s but became widespread in the late 1970s
  - Became part of multi-drug regimens from 1981/2

# Rifampicin and clofazimine

- Both were developed in the 1960s
- Found to be active against leprosy
- Too expensive for widespread use at that time
- Included in multi-drug regimens in 1981/2

ESCMID Online Lecture Library  
© by author



# **WHO Study Group on Chemotherapy of Leprosy for Control Programmes. Geneva 12-16 October 1981.**

- Two objectives in treating MB leprosy:
  - To cure the patient, even in the presence of dapson resistance
  - To interrupt the transmission of the infection in the community



# Newer drugs

- |                           | Monthly dose |
|---------------------------|--------------|
| • Flouroquinolones        |              |
| – Ofloxacin, moxifloxacin | 400 mg       |
| • Ansamycins              |              |
| – Rifabutin, rifapentine  | 600 mg       |
| • Diarylquinoline         |              |
| – Bedaquiline (R207910)   | ?            |
| • Tetracyclines           |              |
| – Minocycline             | 100 mg       |
| • Macrolides              |              |
| – Clarithromycin          | 500 mg       |

# Characteristics of anti-leprosy drugs

Drug	Dosage (mg)	Ratio of peak serum conc to MIC after one single dose	Number of days peak serum conc exceeds MIC	Bactericidal activity
Rifampicin	600	30	1	High
Dapsone	100	500	10	Low
Clofazimine	50 - 100	-	-	Low

WHO, 1982

# Characteristics of anti-leprosy drugs

Drug	Dosage (mg)	Percentage of viable bacilli killed by a single dose, in the mouse foot pad
Rifampicin	600	88.6
Rifapentine	600	87.2; > 95.1
Minocycline	100	38.4; 77.2
Moxifloxacin	400	89.4; 91.1
Bedaquiline	n/a	> 89.4; 95.1

Ji B et al, 2006

# Adverse effects

- Dapsone
  - Haemolytic anaemia, hypersensitivity syndrome, psychosis
- Rifampicin
  - Red urine/tears, hepatic dysfunction
- Clofazimine
  - Darkened skin, abdominal pain (only at high doses)
- Flouroquinolones
  - Contra-indicated in children, tendon rupture
- Minocycline
  - Dangerous when out-of-date

# Other regimens for leprosy

- ROM (Rifampicin, Ofloxacin and Minocycline)
  - Fully supervised, monthly dose
  - Single dose for single lesion leprosy
  - Variants include PMM, etc.
- U-MDT (Uniform MDT)
  - 3 drugs for 6 months
- Treatment for rifampicin-resistant cases (WHO)
  - 6 mths of daily clofazimine (50mg), plus two (O,M or C)
  - Then 18 mths of daily clofazimine, plus one (O or M)

# References

- Balagon M et al. Long term relapse risk of MB leprosy after completion of 2 years MDT in Cebu, Philippines. *Am J Trop Med Hyg* 2009; 81(5):895-9.
- Ji B, et al. Bactericidal activities of R207910 and other newer antimicrobial agents against *M leprae* in mice. *Antimicrobial Agents and Chemotherapy* 2006; 50(4): 1558-60.
- WHO: Chemotherapy for leprosy control programmes. *Technical Report Series*. 1982; 675.

Thank you!

ESCMID Online Lecture Library  
© by author

