

High time to tackle childhood tuberculosis

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When Robert Koch published his groundbreaking paper on the aetiology of tuberculosis (TB) in 1882, he reported that about a third of the working population died of TB [1]. World TB Day today should remind us not only about the first identification of the tubercle bacillus but also that the main burden of the TB epidemic has shifted from Europe to other regions in the world. The 329,391 reported TB cases in the WHO European Region in 2009 contribute only 5.6% of all newly detected TB cases and relapses in the world, according to the latest report *Tuberculosis surveillance in Europe 2009*, jointly published by the European Centre for Disease Prevention and Control (ECDC) and the WHO Regional Office for Europe [2]. Furthermore a sustained decline in TB can be noted with a mean annual reduction of 3.8% between 2005 and 2009, mainly attributable to the high- and intermediate-burden countries in the European Union (EU) and European Economic Area (EAA).

Efforts to build a comprehensive TB surveillance system in Europe date back 15 years, when recommendations for uniform reporting of TB were published in 1996 in the first issue of *Eurosurveillance* by an expert group including governmental and non-governmental representatives from 37 countries [3]. The system established has allowed developments to be monitored: despite the reassuring overall decline in TB incidence, several challenges lurk in these data, as the analysis by Hollo et al. in this issue reveals [4]. Their data show a marked geographic heterogeneity: some countries in the EU/EAA belong in the group with the highest proportions of multidrug-resistant TB in the world; also alarming proportions of patients lost to follow-up are observed and declining rates of culture confirmation of cases.

For the first time, the epidemiology of TB in children within the EU/EAA is put in the spotlight by Sandgren et al. [5]. Analysis of 10 years' data on this neglected aspect of TB shows that about half of the TB cases in children were less than five years of age. The incidence in this age group was higher than for children aged 5–14 years and the average annual percentage change in notification rates for 1–4 year-olds in low-incidence countries (defined as incidence less than 20 per 100,000 population) increased between 2000 and

2009 by 7.4%. Even though it remains unclear if this rise is due to an overall increase in the risk of infection in the population or is the result of recent transmission in outbreaks, it shows that TB prevention and control does not reach those in the most vulnerable age group in Europe. This is supported by the fact that the overall treatment success of 75% for culture-confirmed paediatric TB cases in low-incidence countries was well below the 85% WHO target and almost one third of children were lost to follow-up in 2008. The true burden of disease in children, however, remains unclear as only 16.9% of all cases in this analysis were confirmed by culture showing, as the authors conclude, that there is an urgent need to address TB diagnosis in children.

The occurrence of TB in children can serve as a marker for recent transmission, but at the same time, it also represents a failure of public health prevention [6]. For decades *Bacillus Calmette-Guérin* (BCG) vaccination has been a main element of prevention of primary TB in children; however, the efficacy of the vaccine varies substantially between different countries and regions worldwide [7]. Thus several low-incidence countries in Europe have revised their BCG policies in recent years, moving from universal to selective vaccination. Guthmann et al. report in this issue on two major changes in BCG vaccination in France, concerning vaccine administration technique and the introduction of a selective vaccination policy in 2007 [8]. The authors looked at vaccination coverage and TB incidence in two types of settings: a high-incidence area of the country with a policy of universal vaccination in comparison with other areas that have selective vaccination targeting high-risk children. While no difference in TB rates in children under three years of age was found, the authors demonstrated a notable decline in vaccination coverage, mainly due to the vaccination technique. Although detailed data on BCG vaccination coverage are regularly retrieved and published by WHO (for 2009, see [9]), data on the use of chemotherapy to prevent TB in children aged under five years in Europe are lacking. As Leung et al. point out, the efficacy of preventive isoniazid therapy for 6–12 months has been shown to reach 90%; however, acceptance and adherence are less than desired [10].

A study by Abubakar et al. in this issue describes a large outbreak investigation in the United Kingdom (UK) that demonstrates the contribution of interferon gamma release assays (IGRA) to active case finding and to our understanding of the risk of transmission [11]. The authors report on the use of IGRA for diagnosis of TB in a large outbreak among college students in the UK, involving 2,284 students between October 2008 and January 2009. In addition to being a close contact of the index case, travel to a high-prevalence area was independently associated with becoming a case. While no information about the type of travel and potential exposure could be collected retrospectively, this study demonstrates that the extent of recent infection in young adults born and living in a low-incidence country may be underestimated.

As this studies shows, important progress has been made in recent years in diagnostic techniques for TB infection. Unfortunately, however, the same cannot be said for the diagnosis in children. While a large number of studies have been published over the past few years on the use of IGRAs, including sensitivity, specificity and positive predictive values, corresponding data for children in the especially vulnerable age group, under five years, are still scarce. This holds also true for new methods of molecular detection of TB. Data on the rapid molecular detection of active TB and rifampicin drug resistance – a method endorsed by WHO as a ‘major milestone for global TB diagnosis’ [12] – have not been published for children, yet.

The studies in this special issue give insight into the epidemiological situation of TB in Europe and show that, despite the overall decreasing trend in incidence, transmission of TB is ongoing, even in low-incidence countries. Identification of *Mycobacterium tuberculosis* infection in children presents a key event allowing early recognition and at the same time intervention to prevent cases in children and adults. Even though the absolute number of active cases in children is much smaller than in adults, the risk of rapid progression to severe disease is much higher, adding a considerable burden to the health system. In addition, every undetected child infected today has the potential to progress to an infectious case of TB for decades in the future.

Thus, the elimination of tuberculosis requires a call for action [13], to put the focus on TB in children – it’s about time.

References

- Koch R. Die Aetiologie der Tuberkulose. Berliner Klinische Wochenschrift. 1882;19(15):221-30.
- European Centre for Disease Prevention and Control (ECDC)/ WHO Regional Office for Europe. Tuberculosis surveillance in Europe 2009. Stockholm: ECDC; 2011.
- Schwoebel V, Rieder HL, Watson JM, Raviglione MC. Surveillance of tuberculosis in Europe. Euro Surveill. 1996;1(1):pii=200. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=200>
- Hollo V, Zucs P, Ködmön C, Sandgren A, Manissero D. Marking 15 years of efforts towards a comprehensive European TB surveillance system: the epidemiological situation of TB in the EU/EEA in 2009. Euro Surveill. 2011;16(12):pii=19822. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19822>
- Sandgren A, Hollo V, Quinten C, Manissero D. Childhood tuberculosis in the European Union/European Economic Area, 2000 to 2009. Euro Surveill. 2011;16(12):pii=19825. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19825>
- Bloch AB, Snider DE Jr. How much tuberculosis in children must we accept? Am J Public Health. 1986;76(1):14-5.
- Fine PE. Variation in protection by BCG: implications of and for heterologous immunity. Lancet. 1995;346(8986):1339-45.
- Guthmann JP, Antoine D, Fonteneau L, Che D, Lévy-Bruhl D. Assessing BCG vaccination coverage and incidence of pediatric tuberculosis following two major changes in BCG vaccination policy in France. Euro Surveill. 2011;16(12):pii=19824. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19824>
- World Health Organization (WHO). Immunization coverage with BCG at birth, 2009. Geneva: WHO; 27 Jul 2010. Available from: http://www.who.int/immunization_monitoring/diseases/BCG_coverage_map.jpg
- Leung CC, Rieder HL, Lange C, Yew WW. Treatment of latent infection with Mycobacterium tuberculosis: update 2010. Eur Respir J. 2011;37(3):690-711.
- Abubakar I, Matthews T, Harmer D, Okereke E, Crawford K, Hall T, et al. Assessing the effect of foreign travel and protection by BCG vaccination on the spread of tuberculosis in a low incidence country, United Kingdom, October 2008 to December 2009 . Euro Surveill. 2011;16(12):pii=19826. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19826>
- World Health Organization (WHO). WHO endorses new rapid tuberculosis test. Geneva: WHO; 8 Dec 2010. Available from: http://www.who.int/mediacentre/news/releases/2010/tb_test_20101208/en/index.html
- European Centre for Disease Prevention and Control (ECDC). Call to action for childhood TB. Stockholm: ECDC. [Accessed 24 Mar 2011]. Available from: http://ecdc.europa.eu/en/healthtopics/spotlight/spotlight_tuberculosis_2011/Documents/Childhood_TB_2011_Call_to_action.pdf