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EDITORIAL: RESPIRATORY INFECTIONS ASSEMBLY

Finding the way through the respiratory symptoms jungle: PAL can help

Respiratory Infections Assembly contribution to the celebration of 20 years of the ERS

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Strikingly, up to one third of all patients attending primary healthcare (PHC) facilities present with respiratory symptoms and are seeking care [1–4]. Underlying causes are wide-ranging, spanning from common cold to pulmonary tumours and their frequencies of occurrence differ widely [1]. Whereas >50% of those seeking respiratory care suffer from acute respiratory infections (ARI) [1], tuberculosis (TB), which is still a deadly killer >125 yrs after the discovery of its causing agent, *Mycobacterium tuberculosis* [5], accounts only for a very small proportion of those consulting with respiratory complaints (often <2%) [1–4, 6, 7]. Chronic obstructive pulmonary disease and asthma are encountered more often than TB and less frequently than ARI. However, worldwide asthma prevalence has been on the increase in several settings during the past few decades [8]. A common point is that all respiratory diseases, if not diagnosed, treated and managed timely and correctly, are problematic for individuals and public health alike.

Another common point is that many respiratory diseases are characterised by similar symptoms; for instance, cough and night sweats can be found in TB, pulmonary tumours and ARIs. Clinicians in PHC facilities, who at the centre of all this, often feel challenged, as finding the right path in a vast jungle of similar respiratory symptoms can be a tedious and misleading endeavour. The complex path constitutes making the correct diagnostic, treatment and management choices for all respiratory patients. Although in many countries helpful guidance exists (in the form of clinical guidelines on how to manage children aged <5 yrs with ARIs [9] and TB patients irrespective of age) [3], there is often no clear indication of how to manage non-TB patients. In fact they account for >97% of all respiratory patients aged ⩾5 yrs.

World Health Organization (WHO) initiatives for integrated disease management in the context of PHC exist, namely guidelines for integrated management of adolescent and adult illness (IMAI) [10] and the integrated management of childhood illness [9]. Undoubtedly they have been useful in the delivery of care for respiratory patients. However, they do not completely cover the entire range of such patients. International initiatives, such as the Global Initiative for Asthma and the Global Initiative for Chronic Obstructive Lung Diseases, have also produced helpful guidelines [8, 11] for PHC practitioners confronted with respiratory disease patients. But these are neither respiratory disease cross-cutting nor fully symptom based. In reality, and especially at the PHC level, respiratory patients are managed on the basis of their symptoms, *e.g.* breathlessness and cough, but in PHC this is sometimes found to be performed in a non-systematic and non-standardised manner. If clinicians are left guideless in trying to find the right path in the respiratory jungle of resembling symptoms, the result of the quest can be compromised, *e.g.* diagnostic quality of respiratory patients, including TB patients, inadequate and unnecessarily costly treatment prescriptions and inefficient referral of patients in the absence of clearly defined referral criteria. Studies supporting this showed that in settings which lacked standardised guidance >85% of respiratory patients were prescribed antibiotics [4, 7] and 40% of respiratory patients consulting first-level health facilities were referred to upper levels [3]. The studies clearly suggest that not all who were prescribed antibiotics needed them and that many of those referred to upper levels could have been potentially treated at the PHC level. Undoubtedly such unguided practises can compromise resource efficiency, affecting both patients and health systems alike.

In 2006, the WHO launched its new Stop TB Strategy (table 1) following intensive discussion with relevant TB stakeholders at national and international levels in different countries and institutions [5]. The strategy was updated in 2009.

The DOTS (directly observed treatment, short-course) strategy, which has contributed enormously to the improvement of global TB control over the past decade [12], was thought to be even more effective through the added value of additional components (table 1), particularly in view of the TB relevant 2015 Millennium Development Goal. The Practical Approach to Lung Health (PAL), which was initiated in 1998 by WHO [13], was recognised to contribute to the strengthening of health systems and, thus, became a sub-component of the new Stop TB Strategy (table 1). It was identified as a means to ameliorate TB suspect selection and case management but going well beyond the sole TB control aspect. PAL can provide answers to all respiratory diseases as it aims to shed light in the

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TABLE 1 The Stop TB Strategy

Pursue high-quality DOTS expansion and enhancement
Secure political commitment with adequate and sustained financing
Ensure early case detection and diagnosis through quality-assured bacteriology
Provide standardised treatment with supervision and patient support
Ensure effective drug supply and management
Monitor and evaluate performance and impact
Address TB-HIV, MDR-TB and the needs of poor and vulnerable populations
Scale-up collaborative TB/HIV activities
Scale-up prevention and management of MDR-TB
Address the needs of TB contacts, and poor and vulnerable populations
Contribute to health system strengthening based on primary healthcare
Help improve health policies, human resource development, financing, supplies, service delivery and information
Strengthen infection control in health services, other congregate settings and households
Upgrade laboratory networks and implement the Practical Approach to Lung Health
Adapt approaches from other fields and sectors, and foster action on the social determinants of health
Engage all care providers
Involve all public, voluntary, corporate and private providers through Public-Private Mix approaches
Promote the use of the International Standards for Tuberculosis Care
Empower people with TB and communities through partnership
Pursue advocacy, communication and social mobilisation
Foster community participation in TB care, prevention and health promotion
Promote use of the Patients' Charter for Tuberculosis Care
Enable and promote research
Conduct programme-based operational research and introduce new tools into practice
Advocate for and participate in research to develop new diagnostics, drugs and vaccines

DOTS: directly observed treatment, short-course; TB: tuberculosis; MDR-TB: multidrug-resistant TB.

respiratory jungle faced by many clinicians. Various studies showing different potential benefits associated with PAL implementation in different countries are summarised in table 2.

WHAT IS PAL?

PAL is an integrated and symptom-based approach focusing on all priority respiratory illnesses encountered in PHC, including TB. PAL tries to shine a guiding light in the vast respiratory jungle. Its patient-centred syndromic approach aims to improve the quality of diagnosis and treatment of respiratory illnesses in a PHC setting. It does so by standardising service delivery through development and implementation of symptom-based clinical guidelines. Importantly, PAL also provides guidance on managerial aspects that are relevant to the health system.

PAL is based on two principal components

Standardisation of clinical care

The components involve the development of country level standardised clinical practice guidelines for first-level (*e.g.* PHC) facilities, which are symptom-based, while those for referral levels should deal with specific respiratory conditions managed at this level. The typical PHC level PAL guidelines make use of key signs leading to diagnostic classification, determination of the degree of severity and decision-making, and have to be consistent with drug prescription regulations, international and national recommendations for disease management and other relevant national or international guidelines (*e.g.* IMAI) in the specific country setting. An example of a PAL-derived diagnostic algorithm is summarised below.

Coordination within the health sector

For efficient respiratory case management, coordination means highly organised collaboration among healthcare workers of different categories and at different levels within the health system. Roles and responsibilities of all those involved in PAL have to be clearly defined in order to ensure fully functioning integration of respiratory services. PAL implementation also requires coordination with national health resource planning and any ongoing healthcare reform(s).

TABLE 2 Reported Practical Approach to Lung Health (PAL) implementation-associated observations in selected countries

Observations	Countries	Ref.
Decreased respiratory patient referral from first level to second level, *e.g.* for further clinical investigation or hospitalisation	Guinea, Kyrgyzstan, South Africa and Bolivia	[2, 3, 14] and S-E. Ottmani; personal communication
Increased number of sputum smear microscopic examinations after PAL training	Syrian Arab Republic, South Africa, Algeria	[4, 6, 15]
Increased probability of detecting tuberculosis among respiratory patients	South Africa, Algeria	[6, 14]
Decreased number of drug prescriptions per respiratory patient or lowered proportion of respiratory patients with prescription of antibiotics in acute upper respiratory tract infections	Tunisia, Morocco, Syrian Arab Republic, Jordan, Algeria, Bolivia and Kyrgyzstan	[2–4, 6, 7, 16]
Decreased number of hospitalisations and emergency room visits of asthma patients	Chile	[17]
Increased cost-effectiveness of tuberculosis care or care of other respiratory diseases	Nepal, South Africa	[18, 19]

TABLE 3 Algorithmic decision tree, leading from symptom(s) to possible diagnosis

Symptoms	Elementary diagnostic criteria	Primary classification	Recommended treatment	Differential diagnosis
Stuffy nose with secretion	Duration: <2 weeks	Acute viral respiratory infection, acute rhinitis	Local vasoconstrictors for 5 days: more specified in real guideline, *etc.*, two nose drops *t.i.d.*	Vascular or allergic rhinitis
	Duration: >2 weeks	Allergic or vascular rhinitis	Histamine-blocker medications (more specified in real guideline), with nasal beclomethasone two nasal inhalations *q.i.d.* or four inhalations *b.i.d.* or with antihistamines alone	Acute rhinitis, acute viral respiratory infection
Facial pain or headache#	No fever	Simple sinusitis	Analgesia (more specified in real guideline) and local vasoconstrictors for 5 days (specified in real guideline)	Periodontitis, tooth decay, malignant neoplasm in oral cavity, tongue, larynx, nose sinuses, temporo-mandibular syndrome, facial migraine, eye or parotid illnesses, *etc.*
	With fever and purulent nose secretion	Mucous and purulent sinusitis	As for simple sinusitis + amoxiciilin 0.5 g *t.i.d.* for 7 days	

The Practical Approach to Lung Health guideline (this excerpt is taken from) also features a disease-specific chapter, enabling the clinician to refine and check the (preliminary) diagnosis, *e.g.* when assessing possible differential diagnostic options. Each country takes responsibility of guideline content. #: list continues in real guideline.

In order to ensure that PAL becomes entirely operational, some technical and managerial elements should be implemented. 1) Guidelines have to be nationally adapted respecting a unique country situation. 2) Suggested treatment options must be feasible (*e.g.* drugs recommended in PAL guidelines are featured on the essential drug list of that country). 3) The minimum equipment for respiratory disease management has to be available at different levels of the health system. Health professionals must be trained in PAL, political commitment must be sustained, and the health management and information system of the country must be used to provide monitoring and evaluation of PAL activities.

PAL adaptation at country level is a must and has to take into account the epidemiological, socioeconomic profile, national health policies, the structure of the health system and available health resources, especially at PHC level [2, 3]. This process involves the establishment of a national working group on PAL, which guides and supports initial PAL activities, such as clinical guideline development.

The group defines the weighting of importance of respiratory diseases contained in the guideline and ensures country-based ownership for PAL from the very beginning. The developed guidelines and training material should be tested, covering all relevant priority respiratory illnesses, equipment and essential drugs, defining roles of all involved healthcare workers and the process of referral in a standardised information system. Furthermore, a national expansion plan has to be harmonised in collaboration with relevant bodies, such as departments of PHC and the national TB programme. For ultimate PAL sustainability, its implementation should be under the leadership of a clearly identified unit within the Ministry of Health, ensuring appropriate links with relevant services.

CONCLUSIONS

PAL represents a comprehensive package for the management of respiratory diseases, covering both technical and managerial aspects. Thus, it provides clear orientation on coordination of healthcare between different levels and within relevant structures of general health services, incorporating well-defined country adapted criteria for patient referral. Complementing disease-specific national and international guidelines, PAL helps the clinician find the right way in the respiratory jungle more efficiently. In fact, PAL guides a diagnosing clinician to: correctly interpret the key signs and symptoms; assess diagnosis (table 3); determine the degree of severity (*e.g.* in asthma patients); suggest adequate treatment; and, if necessary, identify referral options. To date there are ~50 countries with some form of PAL activity in different stages of the multi-step PAL implementation process (S-E. Ottmani; personal communication).

It is expected that long-term application of PAL will further underscore possible PAL impacts as illustrated in table 2. The improved integration of respiratory care is expected to increase the proportion of respiratory patients managed in PHC and to decrease the proportion of hospitalised cases. Improved diagnostic quality of pulmonary TB among respiratory patients and reduced cost of respiratory case management are also among the long-term advantages PAL will ensure.

We must bear in mind that rigorous TB control programmes, being part of stronger health systems, will provide answers to many unresolved TB control challenges, *e.g.* in the prevention of multidrug-resistant (MDR)- and extensively-drug resistant (XDR)-TB [20]. Knowingly, treatment and care of MDR-TB and XDR-TB patients can cost more than 100-fold that of non-resistant TB strain patients. This is ''only'' in monetary terms, leaving alone the dimmer prospect of severe suffering due to prolonged time of treatment, lesser probability of treatment success, higher social costs caused by loss of activity and

economic gains in compromised income. Similarly relevant cost reductions catalysed by PAL can be expected, *e.g.* through reducing unnecessary ambulance services referring exacerbated asthma cases from PHC facilities to hospitals.

Tackling the enormous burden of respiratory diseases including TB in low-, middle- and high-burden European countries takes sustained dedication of more than one individual. Clinicians involved in treatment, care and management of respiratory diseases at all levels (especially at PHC level) can be strengthened in their confidence of finding the right way in a confusing respiratory jungle by the PAL concept. Application of their knowledge plays a key role, and PAL can be a helpful guide in conjunction with other strategies and guidelines for the aforementioned reasons.

The success of further fostering the introduction of PAL in additional countries [21], and its expansion in European countries, supplementing DOTS [22] and adding to its success, also depends on a pivotal role of the European Respiratory Society (ERS). We should not be satisfied with only disease-specific approaches for control of respiratory diseases. Despite the fact that we are clearly not advocating abolishing such strategies, the ERS stresses the heightened importance of symptom-based approaches, such as PAL and its benefits. Thus, it can help clinicians and health systems in better handling respiratory patients and help patients by ameliorating their care. Without strongly emphasising the significance of PAL by scientific and public-health bodies, the way through the respiratory jungle risks remaining tedious and error laden. PAL and its concerted promotion can provide a comprehensive package for the full breadth of respiratory situations encountered by clinicians (from dealing with mild stages of asthma to recognising the importance of dangerous threats such as MDR- and XDR-TB) and dealing with them adequately.

STATEMENT OF INTEREST

None declared.

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