Tantangan dalam Pengembangan Sediaan Inhalasi Antituberkulosis = Challenges in the Development of Antituberculosis Inhalation Dosage Form

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Abstrak

ABSTRAK
Tuberkulosis (TB), suatu penyakit infeksi saluran pernapasan yang disebabkan oleh bakteri Mycobacterium tuberculosis, merupakan salah satu penyakit dengan prevalensi yang tinggi di Indonesia. Namun demikian, terapi oral antituberkulosis dalam jangka panjang dapat menimbulkan sejumlah efek samping dan berpotensi kepada ketidakpatuhan pasien. Pada kasus ini terapi inhalasi dinilai sebagai salah satu strategi untuk meningkatkan efektivitas pengobatan tuberkulosis yang prospektif. Faktanya, tidak ada satupun sediaan inhalasi untuk antituberkulosis di Indonesia hingga saat ini. Sehingga tujuan penulisan ini adalah mengeksplorasi perkembangan dan mengidentifikasi tantangan dalam penelitian sediaan inhalasi antituberkulosis, serta prospek produksi sediaan inhalasi di Indonesia. Metode literature review dilakukan dengan pencarian dengan kata kunci antituberculosis inhalation pada google scholar, ScienceDirect, PubMed, situs clinical trial FDA dan situs BPOM. Penelitian terbaru sudah terfokus pada sediaan dry powder inhalation (DPI), letak perbedaan terlihat dari cara produksi dan zat pembawa obat. Ditemukan beberapa tantangan yang dihadapi dalam pengembangan sediaan inhalasi, diantaranya, mekanisme pertahanan dari paru-paru, informasi pengembangan obat yang belum terkumpul secara komprehensif, proses produksi yang berbeda, biaya produksi yang jauh lebih mahal, dan sulit menemukan model biologis untuk pengujian yang tepat. Namun, terdapat banyak bentuk rekayasa partikel dan kombinasi formulasi untuk pengembangan sistem pengiriman inhalasi. Sediaan dalam bentuk DPI dengan metode spray drying yang mungkin bisa diterapkan di Indonesia.
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<i>ABSTRACT
Tuberculosis (TB), a respiratory infection caused by the bacterium Mycobacterium tuberculosis, is one of the diseases with a high prevalence in Indonesia. However, long-term antituberculosis oral therapy could cause several side effects and had a potential for disobedience patients. In this case, the inhalation therapy is considered one of the strategies to increase prospective tuberculosis treatment effectiveness. In fact, there is no inhalation device for antituberculosis in Indonesia until now. Therefore, this paper aims to explore developments and identify challenges in research on antituberculosis inhalation dosage forms and the prospects for inhalation dosage forms production in Indonesia. The literature review method was performed by searching for the keyword antituberculosis inhalation on google scholar, ScienceDirect, PubMed, FDA clinical trial sites, and BPOM sites. Recent research has focused on dry powder inhalation (DPI), where differences were seen in how they were produced and the drug carrier. Several challenges were found in the deal with the development of inhalation preparations, including defense mechanisms of the lungs, drug development information that had not been collected comprehensively, different production processes, much more expensive manufacturing costs, and difficult to find biological models for proper testing. However, there were many techniques of particle engineering and a combination of formulations for the development

of inhalation delivery systems. Preparations in form of DPI with spray drying method that may be applied in Indonesia.<i/>