

Joe Babin

Occupational Lung Disease

NHL

PA

CSHA

interagency task committee -

7/6/73 20 enactment date

May 15th 1973 5 year plan - ~~meta~~

Resp. tract slow turnover of tissue
thin barrier

mucus & particle size 10 μ max 1 μ

mucus transport - balance of elastic & viscous properties
critical

quality and quantity of mucus

unknown properties of mucus in small airways

fate of agents that have penetrated

1. penetrate air blood barrier
2. lymphatics
3. mucus ciliary tract

air blood barrier - ~~poor~~ endothelial junctions

basement membrane - 500 A - solubility

epith. junction alveolar cells fused
integrity of barrier

rapid pericyte transfer 9 microns/sec
across epith. in both directions very rapid

Lymphatics - do not exist in alveolar wall

loose tortuous junctions

well adapted for transport of fluid

and macromolecules from basement membrane area

alveolar and airway macrophages

different population of macrophages

immobilized macrophages

early clearance

Immunology - Nitlenham compare lung

sheep blood cells

lung - ineffective minimum 1/2 of lung
circulation

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antibody synthesis in spleen
after infection - mount a greater response

DeCoster - local immunity in lung
secretory immunoglobulin elaborated
independent of generalized

Secretory IgA - Baricoid molecule
suppresses antigenicity of material
T_H1 + antigen → immune complex that
does not fix complement - sequestering
of immune info.

neutral and alkaline proteases in alveoli intratracheally
can cause emphysema & chronic bronchitis

Refinder - response - release of macrophages & leukocytes
from free as observed
particle challenge

concept of macrophage → escalation theories

Waxman - acute and chronic inflammation
mechanism

lack of application of immunology to lung

Tokley
& Martin

1. Fibroblast & Collagen

What stimulates fibrogenesis (unknown yet)

respirator silicon - silica destroys macrophage

2. mediators

Plasma - C₃ & C₅

C_{3a} & C_{5a} (anaphylatoxins) ^{cellular fibrosis} vasoactive

Kinin - Kallikrein, Bradykinin

Bone marrow, platelets, mast cells

Lysozyme at discharge - perils & macrophage
Histamine, 5HT mast cell

SRSA 1952 described - still unknown

Prostaglandin - thought to be
vasoactive

Classes of reaction

- Anaphylactic IgE (atopic reaction) antigen + IgE - degranulation
immune complex driven perils & macrophage

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Eosinophil attractant factors

Chronic inflammation

Lymphocytes
17 named entities released from activated lymphocytes.
MIF, Macr. AF
Chemotactic subp., macrophages.
etc.

Helper effects B lymphocytes respond to antigen
(mitogenic factor) only with help of T lymphocytes + antigen
Suppressor effects - ill. defined
- immunotolerance -

Cell mediated immunity (delayed hypersensitivity)

T lymphocytes + antigen \rightarrow macrophages activated
granuloma - long lasting delayed reaction

Cell mediated - atypical eosinophil hypersensitivity

retest reaction (eosinophil)

Pete Ward - lymphocytes release a factor + antigen \rightarrow eosinophil attractant

mediator \rightarrow macrophages \rightarrow necrosis in immediate vicinity

destruction + replacement of tissue in granuloma formation

immunologic

cell mediated

antibody mediated

schistosomiasis granuloma in mice

delayed type - lymphocyte mediated

plastic bead granuloma

activating plasma enzymes

kinin \rightarrow local macrophage accumulation

any antigen kept at local site

and released over a long period

will cause a granuloma

processor of antigen \rightarrow act. of lymphocytes

mechanism

cyclic AMP
cyclic GMP

prostaglandins

one supports
other suppresses

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acute \rightarrow Chronic
transition
not discussed

Rylander - animal model system

Bernade, Duke 1965

functional knowledge - mass transport \rightarrow cellular reactions

information \times
immunogenic
specificity

practical application

use info now available

air pollution criteria \rightarrow sell the info
smoke criteria

basic research - direction experience recently

Merrell Chase - Chemical Nature of Agents

toluene diisocyanate - asthma like disease in plant workers

acute bronchitis - spillage

acute form of it during working with recovery after work

thermophilic actinomycetes - ~~fungi~~

fungi for cattle in eq units.

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Saltzman - Research Reports

Stimuli] Polysphendic acid
Anticilia] ~~Polysphendic acid~~

extrinsic hypersensitive alveolitis

Relaxation - smooth muscle
eliminate secretions
mucosa or submucosa
change
dose response
temporal
~~temporal~~ central
peripheral

* periphery ① closing volume as a simple test of
peripheral airway *
vertical pressure
at TLC apex lower pressure
base higher pressure
volume at ^{unit} dependent airway close
60% of cigarette smokers not necessarily symptomatic
80% of asthmatic

only small group showed discrepancies in other lung function tests

① decrease resistance

② increase volume

Nadel tests bantalan dust coating - at 800x airways visible.
5-1mm vagal effect

Mitchell: PEFV curves at something other than
normal

Sail superfused isolated guinea pig tracheal strips

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