

Obstacles to Efficient Pathology Diagnosis in Developing Countries

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Requirements for Efficient Diagnosis

- Adequately Trained Pathologists in sufficient Numbers
- Trained Laboratory Technologists
- Reliable Equipment and Reagents
- Internal and External Quality Assurance Programs
- Licensing, Accreditation and certification

HEALTH SYSTEMS RESOURCES

WHO Health Statistics 2008

Country	Physicians per 10000 population	Lab Health Workers per 10000 population	Per Capita Expenditure on Health(US \$)
Australia	25	4	3181
UK	23	3	3064
USA	26	23	6350
India	6	<1	36
Nigeria	3	<1	27
Pakistan	8	<1	15

Country	Society	Ratio Members/ Million	Rank
United Kingdom	Royal College of Pathologist	109.0	1
Australia	Royal College of Australasia	95.2	2
Italy	Associazione Italiana Patologi	57.4	3
Indonesia	Ikatan Ahli Patologi Indonesia	2.4	35
Colombia	Sociedad Columbiana de Patologia Clinica	2.3	36
India	Indian Association of Pathologists	2.3	37

Inadequate manpower

- Pathologists per million population
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- Tanzania 0.1
- Laos 0.2
- Ghana 0.4
- Uganda 0.64
- Pakistan 10.00
- UK 109.00

Surgical Pathologist's Workload

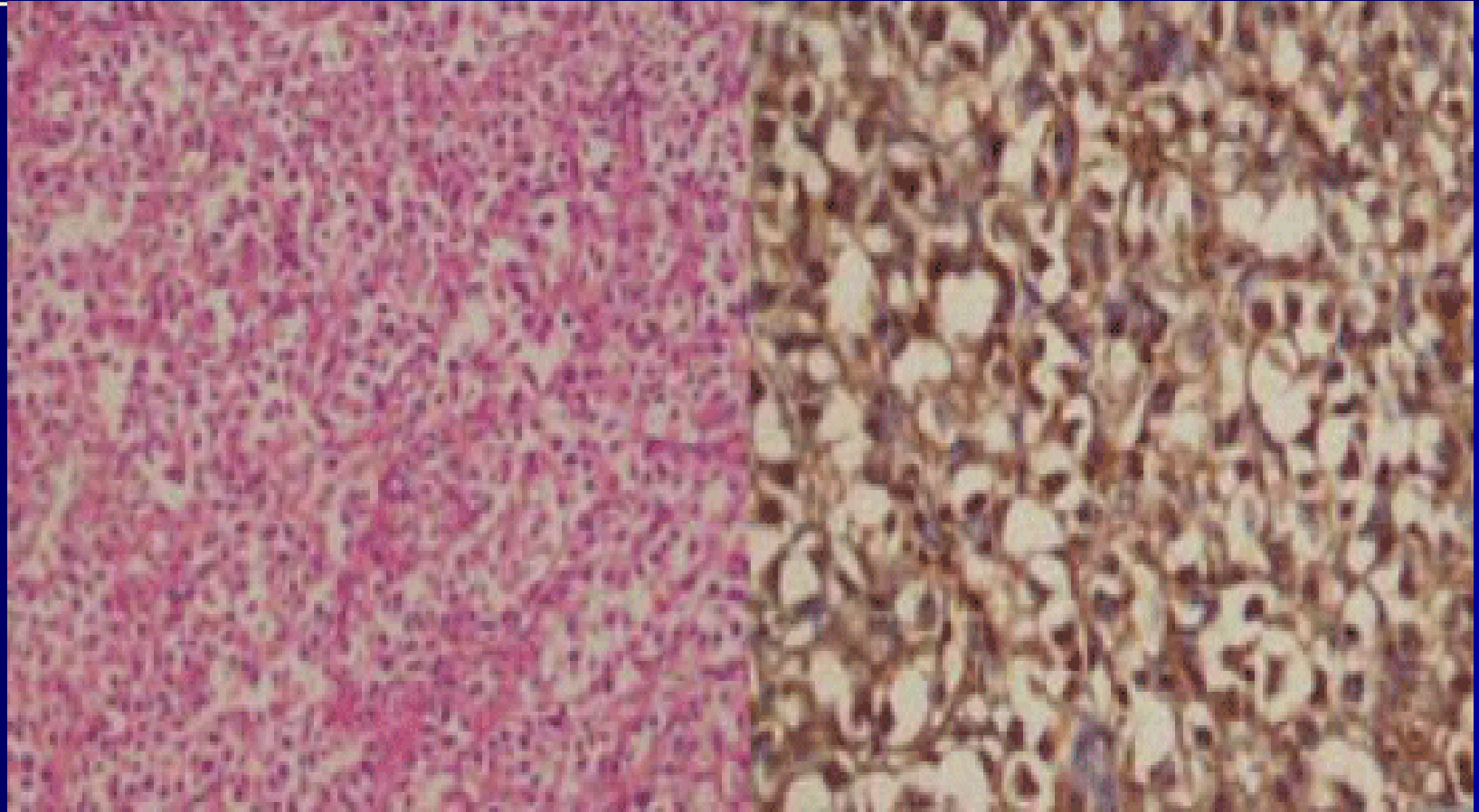
- Heavy Workload 10000 Surgicals/Year
- Few Haematopathologists

Lab Technologists

- Inadequate Training
- Poor Emoluments and Service Structure
- Insufficient Numbers

In vitro diagnostic medical devices.

- Poor Quality Reagent Kits
- Equipment Repair and Maintenance Poor
- Erratic Power Supply
- Expensive



Prohibitive Cost

Cost of IHC Lymphoma work up
income for one month

No Immunohistochemistry	60 %
Institutions equipped	6

Diagnosis and Classification

- Morphology
- Immunophenotyping
- Cytogenetic
- Molecular

Diagnosis Review

■ Total Cases	40	
■ Concurrence in the review and initial diagnosis	11	28%
■ Required modification according to the WHO classifications	12	30%
■ benign or malignant diagnosis remained the same but disagreement in the specific diagnostic entity.	13	32%
■ initial diagnosis of malignancy changed to a benign lesion.	4	10%

Hamdani S N R, et al
Pak J Med Sci
2008;24(6):798-802.

What Can Be Done

Education

**Solutions Based on Ground
Realities**



1. Panel of experts in Hematopathology
2. Protocol for Reporting LN Biopsies
3. Training of Pathologists
4. Workshops in Lymph Node Pathology
5. Referral Services
6. National Lymphoma Study Group
7. Central Registry and Tissue Bank
8. Centre for Immunohistochemistry.

Non Hodgkin's lymphomas FNA

- Accurate diagnosis of NHL 67/95 (70.5%)
- Accurate grading 65/95 (68%)
- Accurate cytologic grading
 - low grade, 14/15 (93.33%)
 - intermediate 11/18 (61.11%)
 - high grade 40/62 (64.5%)

Mathur S etal

Diagnosis and grading of non-Hodgkin's lymphomas on fine needle aspiration cytology

Ind J Path MicBiol2007:1:45-46

Burkitt Lymphoma

Haematoxylin and Eosin Slides

■ Total	138
■ sensitivity	93.2%
■ specificity	50%
■ positive predictive values	91.7%
■ negative predictive values	55.6%.

Lukande,R et al

East African Medical Journal 85 (5) 2008: 207-212

Working Formulation

- Originally intended to translate among the previous classifications, not to replace them.
- Based solely on the morphology of H&E stained sections.
- Groups the lymphomas into morphologic categories that may encompass several individual diseases, and biologically unique diseases may appear in multiple categories.

Despite these significant drawbacks, the Working Formulation's categories do have clinical validity (therapeutic and prognostic) and are based on relatively simple, reproducible morphologic features. The criteria are both architectural (low magnification) and cytological :

Diagnostic Accuracy

- Prospective intradepartmental review of cases.
- Retrospective intradepartmental review of diagnoses rendered,
- Selected utilization of inter-institutional second opinions referred to pathologists with subspecialty expertise within specific organ systems and disease categories, and
- Mandatory review of pathology materials in which the diagnosis was reported at external institutions when patients are referred for definitive therapy within the "home" institution (Tomaszewski, et al., 2000; Sarewitz, n.d.).

Tele Pathology

- Flexibility of use.
- Discussion within dedicated user groups.
- Collect information from different sources.

- Provide feedback to senders of specimen by presenting them images of important findings.
- International Consultations



**Armed Forces
Institute of Pathology**

عسکری ادارہ برائے علم امراض