

THE KNOWLEDGE, ATTITUDES AND UTILIZATION OF THE 1997 NATIONAL TB CONSENSUS FOR CHILDREN IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS AMONG PHYSICIANS AT THE PHILIPPINE CHILDREN'S MEDICAL CENTER

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ABSTRACT

Objective: To assess the knowledge, attitudes and utilization of the 1997 National TB Consensus for Children among physicians at Philippine Children's Medical Center in the diagnosis of pulmonary tuberculosis.

Setting: Philippine Children's Medical Center

Design and Participants: Descriptive study design with a self-administered 30-point questionnaire involving 3 domains (knowledge, attitude and utilization) as a survey instrument was given to all pediatric consultant staff at the Philippine Children's Medical Center

Results: Response rate was 66%. Ninety-four percent of physicians at PCMC have knowledge of the 1997 National TB Consensus for Children, however, only 78% utilize it in their practice. Their type of practice (77.7%) (academician, clinician, researcher) and their being in a training institution (54.4%) obliged them to use the consensus. However, their experience and the number of years in practice individualized their diagnosis for pulmonary TB. The older the physicians, the lesser use of the consensus. Socioeconomic status (51.8%), cost (63.6%), availability of diagnostic tests (61.1%), and endorsements by different societies (59.9%) including the PPS as well as their respective subspecialties did not affect utilization of the consensus. Respondents (61.8%) felt the need to revise the consensus as diagnosis of pulmonary TB in their practice is individualized.

Conclusion: Majority of the physicians at the National TB Consensus for Children and have been utilizing it in their practice. The factors that may have contributed to their utilization of the consensus include: type of practice (academician, researcher, clinician) and being in a training institution. On further analysis, it was found that the longer they are in practice, the less frequent they utilize the consensus. Majority agreed for a need to revise the consensus.

INTRODUCTION:

Tuberculosis continues to be responsible for great morbidity and mortality worldwide. Despite diligent efforts in controlling the disease, it has remained a major public health problem. The World Health Organization (WHO) estimates that one-third of the world's population are infected with the disease¹. As of 1995, based on case notification rates for tuberculosis submitted to WHO, the Philippines ranked no. 4 in the world and no. 2 in the Western Pacific region with a reported rate of 348.5/100,000 population².

The Health Intelligence Service (HIS) of the Department of Health (DOH) has been able to report annual data on tuberculosis as early as 1906. From the HIS data, tuberculosis has been among the top 5 causes of morbidity and mortality for the last 5 years. In the latest figure available, as of 1993, tuberculosis was the 5th leading cause of morbidity, reported at a rate of 237.5/100,000 population. It was also the 5th leading cause of mortality, reported at a rate of 36.7/100,000 population, and accounted for 7.7% of all deaths³.

Because of the urgency to focus on addressing the problem, clinical practice guidelines have been used worldwide to have a standardized approach in the diagnosis and management of childhood tuberculosis. By 1993, the United States, Canada and Australia^{3,4,5,6} started forming groups that worked on standardizing the diagnosis, treatment and care for TB patients. Here in the Philippines, both private and government institutions worked hand in hand in creating such standardized approach. In 1997, the National TB Consensus for Children was developed⁷.

In this age of practice guidelines, it should be noted that their usefulness is limited unless they are embraced and implemented by practicing physicians. By far, very few studies have dealt with the way our physicians view the use of the practice guidelines. Input from the physicians regarding its use is therefore crucial.

OBJECTIVES:

The primary objective of this paper is to assess the knowledge, attitude and utilization of the 1997

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Keywords: Tuberculosis, clinical practice guidelines

National TB Consensus for Children in the diagnosis of pulmonary tuberculosis in children among physicians at the Philippine Children's Medical Center.

Specific Objectives:

1. To be able to determine if the subjects are knowledgeable about the criteria used in the diagnosis of pulmonary tuberculosis in children based on the 1997 National TB Consensus for Children.
2. To determine if there is a need to revise the consensus.
3. To determine the factors affecting the utilization of the consensus in the diagnosis of the pulmonary tuberculosis in children.
4. To determine if their subspecialties affect their utilization of the consensus in the diagnosis of childhood pulmonary TB.

METHODOLOGY

A descriptive study design with a self-administered questionnaire as a survey instrument was used in this study. All pediatric consultant staff at the Philippine Children's Medical Center were included. Subjects were selected by convenience sampling and only those who were present during the study period from November 1, 2001 to November 24, 2001, were included in the study. A 30-point questionnaire involving 3 domains (knowledge, attitude, and utilization of the consensus) was distributed personally among the consultant staff of Philippine Children's Medical Center. Demographic data such as age, sex, number of years of practice, specialty/subspecialty, and average numbers of pediatric TB patients seen every year were noted. The questionnaire was pretested to 9 possible subjects to test for validity using the Cronbach Coefficient Alpha. After pre-testing and the necessary revisions made, the questionnaires were then distributed to the subjects. All accomplished questionnaires were collated, encoded, and submitted for statistical analysis using averages, frequencies and percentages. The correlation between continuous variables was analyzed using Pearson's Correlations Coefficient while the correlation between binary variables and interval scales were analyzed using point bi-serial correlation.

RESULTS

Demographic Profile of Respondents

A total of 87 consultant staff of Philippine

Children's Medical Center was eligible for the study but only 55 (66%) participated. Those who were not included refused to participate, were judges for the research paper contest, or were not available during the study period. Of the 55 respondents, 40 (72.73%) were females and 15 (27.27%) were males. The age of the respondents ranged between 34-73 years, with a mean age of 48.5 years. Twelve (21.8%) respondents were general pediatricians and the remaining 78.2% were subspecialists. This also shows the respondent's number of years in practice and their patients seen every year. (Table 1)

Table 1. Characteristics of Respondents

Total number of consultants	87
Total number of respondents	57 (66%)
Sex:	
Male	15 (27%)
Female	40 (73%)
Age range	34 - 73 years
Mean age	48.5 years
Subspecialty:	
General Pediatrics	12 (21.8%)
Infectious	3 (5.45%)
Neonatology	6 (10.91%)
Cardiology	2 (3.64%)
Ambulatory	2 (3.64%)
Nephrology	4 (7.27%)
Pulmonology	3 (5.45%)
Neurology	6 (10.91%)
Gastroenterology	3 (5.45%)
Adolescent Medicine	4 (7.27%)
Intensive Care	4 (7.27%)
Hematology	4 (7.27%)
Others(Allergy & Endocrinology)	4 (7.27%)
Number of years of practice:	
0 - 5 years	10 (18.18%)
6 - 10 years	9 (16.36%)
>10 years	36 (65.45%)
Number of TB patients seen per year:	
0 - 10	8 (14.55%)
11 - 30	25 (45.45%)
30 - 50	11 (20%)
>50	13 (31%)

Reliability Analysis

The frequencies of responses for the 30 items of the questionnaire were tabulated and none of the questions had >80% response in one category. All of the items therefore could discriminate between extreme responses using the frequency endorsement method.

Reliability analysis was done to test for internal consistency or homogeneity of the items using Cronbach's coefficient alpha. This method showed that the combination of all the questions and removal of each question resulted to scale reliability coefficient of <0.78. Values ranged from - 0.0212 to 0.5580. All the questions were retained and showed no significant inter-item variability or had good inter-item reliability.

Descriptive Interpretation of Results

In assessing the knowledge of the respondents regarding the consensus, 94.6% claimed that they were aware of the 1997 National TB Consensus for Children. Both the age and specialty did not show any correlation with regards to awareness of the consensus (Table 2). One hundred percent of the respondents believed that the consensus was conceptualized to guide the clinicians in the diagnosis of pulmonary tuberculosis in children and majority (83.5%) perceived that it was necessary in the diagnosis of PTB. In 90.9% of respondents, they felt that the consensus standardized their diagnosis in children with PTB. Using the Pearson's correlation coefficient, it was also noted that the younger physicians deemed the consensus necessary for the diagnosis of pulmonary tuberculosis.

Forty-four percent of the respondents did not think that using 3 of the 5 criteria underdiagnosed children with PTB although almost the same number of respondents (43.4%) felt that it did. Majority (91.1%) believed that exposure to an adult/adolescent with pulmonary tuberculosis is one of the criteria used in the diagnosis. Forty-nine respondents (90.09%) perceived that an induration of 10 mm regardless of the vaccination status is a positive Mantoux test. However, 22 respondents (40%) did not believe that a >5mm induration for children above 5 years old with or without BCG is a positive tuberculin test. Fifty percent (27 respondents) likewise did not think that abnormal chest x-ray in the form of pneumonitis is one of the criteria used in the diagnosis of childhood TB. Eighty three percent of the respondents perceived that TB culture is the gold standard in the diagnosis.

A total of 78.18% of the respondents utilized the consensus. The subspecialists used the consensus

more often than the general pediatricians. However, 63.5% of the respondents did not agree that their subspecialty affected their decision to utilize the consensus. Seventy-eight percent (78%) of the respondents believed that their experience affected their decision to utilize the consensus, and 51.9% felt that the diagnosis of childhood pulmonary TB should be individualized. Younger respondents tended to utilize it more often than the older respondents.

It was also found out that in 51.8% of the respondents, the socio-economic status of the patient, the cost and availability of the diagnostic tests did not affect their decision to use the consensus. For the older respondents, these factors did not affect their decision to utilize the consensus.

More than sixty-one percent (61.7%) of the respondents did not believe that endorsement by different pediatrics societies affected their decision to use the consensus. A total of 64.8% of the respondents also felt that their status in the Philippine Pediatric Society did not oblige them to use the consensus. Forty-nine of the respondents were not obliged to use the consensus in the diagnosis of pulmonary TB because they are members of the Philippine Pediatric Society. Likewise, in 62.2% of respondents, their high regard for the authors did not encourage them to use the consensus.

In 77.7% of respondents, their type of practice (being academican, clinician) affected their decision to use the consensus. More than fifty-four percent (54.4%) felt that they were obliged to use the consensus because they were in training institutions.

Over 60% of the respondents believed that the National TB Program endorses the use of the consensus and that the PPS hold seminars on the use of the consensus. However, 49% of the respondents, did not feel that the efforts of the government and the PPS were enough to disseminate information regarding the consensus. Almost half (48%) were unsure whether the consensus was included in the medical curriculum.

Although majority of the respondents (79.9%) stated that they will endorse the use of the consensus in the diagnosis of pulmonary TB, 61.8% felt the need to revise the consensus. Using the point bi-serial correlation, it was noted that older physicians tended to agree more regarding the need to revise the consensus (Table 2). Based on the specialty, both general pediatricians, and subspecialists, agree that there is a need to revise the consensus. (Table 3)

Table 2. Pearson's Correlation Coefficient

Item 20	Other Subspecialty	General Pediatrics	Total	Item 20	0 to 5 yrs	6 to 10 yrs	>10 yrs	Total
Strongly Agree	8	1	9	Strongly Agree	1	1	7	9
	14.55%	1.82%	16.37%		1.82%	1.82%	12.73%	16.36%
Agree	15	9	24	Agree	2	5	17	24
	27.27%	16.36%	43.63%		3.64%	9.09%	30.91%	43.64%
Unsure	12	1	13	Unsure	3	3	7	13
	21.82%	1.82%	23.64%		5.45%	5.45%	12.73%	23.64%
Disagree	8	1	9	Disagree	3	0	5	8
	14.55%	1.82%	16.36%		5.45%	0%	9.09%	16.36%
Strongly Disagree	0	0	0	Strongly Disagree	0	0	0	0
Total	43	12	55	Total	9	9	36	55
	78.19%	21.81%	100%		16.36%	16.36%	65.45%	100%

Item 21	Other Subspecialty	General Pediatrics	Total	Item 21	0 to 5 yrs	6 to 10 yrs	>10 yrs	Total
Strongly Agree	5	2	7	Strongly Agree	0	3	4	7
	9.09%	3.64%	12.73%		0%	5.45%	7.27%	12.72%
Agree	30	6	36	Agree	9	5	21	35
	54.55%	10.91%	65.46%		16.36%	9.09%	38.18%	65.45%
Unsure	2	2	4	Unsure	0	0	4	4
	3.64%	3.64%	7.28%		0%	0%	7.27%	7.27%
Disagree	5	2	7	Disagree	0	1	6	7
	9.09%	3.64%	12.73%		0%	1.82%	10.81%	12.63%
Strongly Disagree	1	0	1	Strongly Disagree	0	0	1	1
	1.82%	0%	1.82%		0%	0%	1.82%	1.82%
Total	43	12	55	Total	9	9	36	55
	78.18%	21.82%	100%		16.36%	16.36%	65.45%	100%

Table 3. Pearson's Correlation Coefficient

ITEM	SEX	SPECIALTY	AGE
Item 1	-0.26972	-0.08601	0.144
Item 2	-0.24363	0.10975	0.15033
Item 3	-0.12856	0.04712	0.20228
Item 4	-0.18477	0.17806	0.10777
Item 5	0	0.0065	-0.05518
Item 6	-0.00586	-0.19566	-0.10697
Item 7	-0.11586	-0.19566	-0.14174
Item 8	-0.19271	-0.13918	0.04122
Item 9	0.01059	0.06479	0.03016

Table 3. Pearson's Correlation Coefficient (cont'd)

ITEM	SEX	SPECIALTY	AGE
Item 10	-0.13148	0.39661	0.2913
Item 11	0.14712	0.02555	0.17047
Item 12	-0.1563	0.04125	0.10551
Item 13	-0.18323	0.10144	0.02491
Item 14	-0.16975	-0.03048	0.01821
Item 15	-0.00136	0.00898	0.20125
Item 16	0.06902	0.07591	0.04758
Item 17	-0.07765	0.0322	0.19738
Item 18	-0.06709	0.09065	-0.06073
Item 19	-0.21264	-0.37308	-0.09995
Item 20	-0.01016	-0.13033	-0.37519
Item 21	-0.00324	0.04631	0.19409
Item 22	-0.03246	0.01685	0.30829
Item 23	-0.0877	-0.16378	0.15717
Item 24	-0.20807	-0.09372	0.09857
Item 25	-0.0089	-0.12127	0.2511
Item 26	-0.2726	0.12729	0.3345
Item 27	0.01904	0.1641	0.10258
Item 28	0.02619	-0.1359	-0.07843
Item 29	-0.07201	0.7918	0.22108
Item 30	0.4402	0.1355	0.2229

DISCUSSION

Tuberculosis still ranks as one of the top 5 leading causes of morbidity and mortality in the Philippines². Despite the government's effort to eradicate, or at least control the disease, the incidence has remained high. Many efforts have been put up to address this problem. In our country, a clinical practice guidelines was created to help standardize the diagnostic and treatment approach for children with tuberculosis. Since its introduction in 1997, the consensus has helped practicing pediatricians in the diagnosis and treatment of childhood TB. However, the adherence of the practitioners to its use in the diagnosis of childhood pulmonary TB was never assessed.

For the diagnosis of a child with active TB, the National TB Consensus for Children recommends that a child should have 3 out of the 5 criteria to satisfy a

diagnosis of TB disease. These are as follows:

- 1) exposure to an adult/adolescent with active TB disease
- 2) positive Mantoux tuberculin test
- 3) signs and symptoms suggestive of TB
- 4) abnormal chest radiograph suggestive of TB
- 5) laboratory findings suggestive of TB (histological, cytological, biochemical, immunological and/or molecular)⁷.

In this survey, majority of the respondents claimed to have knowledge of the consensus. This was supported by the fact that 83.3% of the respondents knew that the gold standard used for the diagnosis of childhood TB was TB culture and 90% knew that an induration of 10mm regardless of the vaccination status is a positive Mantoux test. On further analysis, variations in responses as to the interpretation of the Mantoux test, number of criteria to be used in the diagnosis of PTB, and chest x-ray interpretation among the respondents were noted. Majority of the respondents did not think that an induration of >5mm for children above 5 years old with or without BCG is a positive tuberculin test nor an abnormal chest x-ray in the form of pneumonitis is part of the criteria in the diagnosis of childhood TB. There was also an equivocal response as to whether three of the five criteria under diagnosed children with tuberculosis. This is probably because test interpretation among physicians varies with the tuberculosis risk and health status of the individual patient they encounter. As has been noted, 78% of our respondents believe that their clinical experience affected their decision to utilize the consensus.

Although majority of the respondents knew that the consensus was part of the National TB Program and was being promoted by the PPS, 49% felt that their efforts were not enough to disseminate information about the consensus. This could have likewise contributed to their knowledge about the consensus.

One of the major issues regarding the use of the consensus was the Mantoux test for screening. Interpretations among physicians are varied as was seen in our study. The American Thoracic Society and the Centers for Disease Control and Prevention recently issued updated recommendations for targeted tuberculin testing and the treatment of latent tuberculosis infection. In their statement, the following interpretations were recommended:

- 1) An induration of 5mm or more is classified as positive in persons with any of the following:

- a. Human immunodeficiency virus infection
 - b. Recent close contact with persons who have active tuberculosis
 - c. Chest radiographs showing fibrosis (consistent with healed tuberculosis)
- 2) an induration of 10mm or more is classified as positive in all persons who do not meet any of the criteria from section 1 but have other risk factors for tuberculosis.
 - 3) an induration of 15mm or more is positive in persons who do not meet any of the criteria from sections 1 and 2.
 - 4) recent tuberculin skin test conversion is defined as an increase in induration of 10 mm or more within a two-year period, regardless of age; and
 - 5) in healthcare workers, the recommendations in sections 1, 2 and 3 generally should be followed.

In facilities where tuberculosis patients frequently receive care, the optimal cut-off point for healthcare workers with no risk factors may be an induration of 10mm or greater⁸.

In spite of this knowledge, only 78.18% of the respondents actually use the consensus in their practice. Individualizing medical care of patients and their experience seemed to be some of the factors that limit them from utilizing it.

Some factors that were deemed to limit utilization of the consensus were the availability and cost of the diagnostic tools, as well as socio-economic status of the patients. However, it was revealed that these factors did not have any bearing on the respondents' decision to utilize the consensus. The PCMC is a tertiary hospital, and being such, the type of practice (clinician, academician, researcher) of our respondents (77%) has influenced more their decision to use the consensus. Fifty four point four (54.4%) percent of our respondents felt obliged to use the consensus because of the fact that they were in a training institution.

Influence as to the use of the consensus in the diagnosis of pulmonary TB by endorsements of different pediatric societies, position in the Philippine Pediatric Society or a high regard for the authors of the consensus did not affect the physicians' attitude towards the use of the TB consensus. This could be

explained by the fact that the respondents put emphasis on the individualized approach in looking and diagnosing their patients with pulmonary TB more than the status or the institution that endorses the consensus.

Most of the respondents especially the younger physicians believed that the consensus was necessary for the diagnosis of childhood pulmonary TB (83.5% of the respondents). This was most likely because, it helped physicians standardize the diagnosis of childhood TB. But despite this, 61.8% felt the need to revise it. In our study, both the subspecialties and the general pediatricians expressed the need to revise the consensus. The older consultants tended to favor its revision. Although the criteria in the consensus were used for the diagnosis of pulmonary TB, some pediatricians believe that not all of it is necessary. For them, diagnosis was on a case-to-case basis, as dictated by their long experience in practice, as well as the number of TB cases seen per year.

CONCLUSION

Tuberculosis continues to be a major public health concern worldwide despite efforts undertaken for its prevention, case identification and treatment. Guidelines have been established to standardize diagnostic modalities through the 1997 National TB Consensus for Children. However, the manner of diagnosis of the disease still varies.

This revealed that physicians at the Philippine Children's Medical Center have knowledge of the 1997 National TB Consensus for Children and majority have been utilizing it in their practice. Being in a training institution and consequently the type of practice they have (clinician, academician, researcher), somehow obliges them to use the consensus. On further analysis, it was found out that their diagnosis was affected by their experience in practice and the number of years in practice. The longer they were in practice, the less they utilized the consensus. Because of such, their approach is more of individualized diagnosis rather than adhering strictly to the recommended consensus.

The socio-economic status of patients, the availability and cost of the diagnostic tests did not affect their decision to utilize it. Also, the endorsements from different societies nor their position at the Philippine Pediatric Society did not have any bearing on their utilization of the consensus. Their respective subspecialties, likewise, was not a factor in its utilization. However, because of the varied size of the

population per subspecialty, no statistical correlation can be made among them.

Our respondents felt the need to revise the consensus.

LIMITATIONS AND RECOMMENDATIONS

This study is a self-report data. Physicians' awareness of the 1997 National TB Consensus for Children and adherence may be overstated. Because some physicians may be aware of the consensus, some may have falsely reported awareness and compliance with the recommendations. Hence, a continuing education of physicians regarding the rationale for the consensus should be undertaken.

We chose to assess the practice and attitudes of physicians based solely at a training tertiary institution. Inclusion of physicians at such institutions would include subspecialists who may perform little

work in the field of primary care or who were solely limited on his/her subspecialty. This may not truly represent the experience outside of such institutions. It is therefore recommended to undertake studies to assess the attitudes and practice of community-based physicians and family physicians to truly assess the experience of children receiving care.

This study concentrated mainly on the diagnosis of children with pulmonary TB. However, other factors that may affect the utilization of the consensus which are as important in the control of TB such as case identification, prevention and treatment were not included in the study. A wider scale of study to include such factors is therefore recommended.

It is also the recommendation of the authors to review the consensus and to conduct more surveys to assess the factors affecting its utilization so that necessary revisions can be made.

REFERENCE:

1. Global Tuberculosis Programme, WHO, Global Tuberculosis Control – WHO report 1997. Geneva: WHO, 1997.
2. Lansang, et al. 1998. Tuberculosis in the Philippines, Areas for Healthy Policy and Systems research. *Essential National Health Research Program, Department of Health* pp1-33.
3. Proceedings of the National Consensus Conference on Tuberculosis. 1997. *Health Canada*. pp 1-3.
4. Jerant, Anthon. Identification and Management of Tuberculosis. May 1998 *American Academy of Physicians* pp 1-20.
5. Tuberculosis in the young: focusing on those at risk. 1998. *Medical Journal of Australia*. pp 100-101.
6. Isaac, David. 1998 Tuberculosis in Australia: strategies for control. *Medical Journal of Australia* 168: 12-124.
7. National Consensus on Childhood TB *Philippine Pediatric Society*, 1997.
8. American Academy of Pediatrics. Committee on Infectious Diseases. Update on tuberculin skin testing of children. *Pediatrics* 1996; 97(2) 282-284.
9. American Academy of Pediatrics. Committee on Infectious Diseases: Screening for tuberculosis in infants and children. *Pediatrics* 93:131, 1994.
10. Committee on Infectious Diseases: 2000 *Red Book*, 25th ed 593-613.