Multidisciplinary Team Meeting in the Core of Nasopharyngeal Cancer Management Improved Quality of Care and Survival of Patients

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ABSTRACT: Nasopharyngeal cancer (NPC) cases are often diagnosed in advanced stages. The complexity of clinical management for advanced-stage NPC requires thorough communication and shared decisions between medical professionals and allied teams. Incorporating a multidisciplinary team meeting (MDTM) for newly diagnosed NPC patients was chosen to facilitate collaboration and communication between physicians. This retrospective study aimed to compare the quality of care, clinical responses and survival between NPC patients treated with and without MDTM. Data on clinical responses, assessment visits, date of progression and death with progression-free survival (PFS), overall survival (OS), and hazard ratio (HR) were collected and analyzed with 95% confidence interval (CI) and significance set as $P < .05$. There were 87 of 178 NPC patients treated with MDTM. Revisions of diagnosis and stage occurred in 5.7% and 52.9% of cases during the MDTM. More clinical responses were achieved by patients treated with MDTM (69.0%vs 32.0%, $P < .00$). NPC patients who received MDTM treatment recommendation had a lower risk for progression (median PFS 59.89 months vs 12.68 months; HR 0.267, 95% CI: 0.17-0.40, $P < .00$) and mortality (median OS was not reached vs 13.44 months; HR 0.134, 95% CI: 0.08-0.24, $P < .00$) compared to patients without MDTM. Incorporating the MDTM approach into NPC management improves patients' clinical responses and survival.

KEYWORDS: Patient care team, nasopharyngeal carcinoma, oncology service, multidisciplinary team meeting

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Background

Nasopharyngeal cancer (NPC) is a highly prevalent cancer in regions around southern China.[1] Almost 90% of patients with NPC who come to tertiary hospitals are in advanced and metastatic stages,[2] making their management more complex. Relapse-free and overall survival rates were lowest in advanced stages compared to in early stages.[3] In advanced and late stages, more treatment modalities are used, such as induction chemotherapy plus concurrent chemoradiation [CCRT], or CCRT followed by adjuvant chemotherapy,[4,5] often with some treatment modifications to adjust for unfit patients. The complexity of diagnosis, treatment modalities, adverse reactions, and patients' problem required various specialized healthcare professionals. Several studies have shown improved treatment decision-making and disease outcome in some cancers through enhanced communication between medical professionals (doctors from relevant disciplines), nurses and allied staff in a multidisciplinary cancer team (MDT) with a regular formal meeting (MDT meetings or MDTM).[6-8] MDT has an important role to facilitate patients assessment, treatment planning according to the national guideline, delivery of services, rehabilitation, and survivorship.[9,10] The rational of regular MDTM is multidimensional and more patient-centered; this forum ensures all patients receive timely diagnosis and treatment,

evidence-based management, and continuum of care.[11] Regular and focused MDTM have been initiated in our hospital since 2016. This retrospective study aimed to compare the quality of care, clinical response and survival between NPC cases that are managed and discussed inside a focused MDT with a weekly MDTM or cases handled without an MDTM approach. This recent work also describes the challenges and benefits faced in conducting MDTM in tertiary academic hospitals.

Methods

Study design

This retrospective study was conducted from October 1st 2019 until May 1st 2022 and was jointly approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada and Dr. Sardjito Hospital in Yogyakarta, Indonesia (number KE/FK/1128/EC/2019).

Study population

Clinical data of newly diagnosed NPC patients between January 1st 2016 and December 31st 2020 were selected from medical records and the head and neck MDTM registry.

Nasopharyngeal cancer (NPC) was diagnosed by histopathology examination from nasopharyngeal biopsy specimens. Diagnostic imaging and staging procedures of NPC used multi-sliced computed tomography scanning, chest X-ray, abdominal ultrasonography, and bone survey as per hospital guidelines. Staging of NPC was performed according to the American Joint Committee on Cancer (AJCC) staging system eighth edition.[12] Patients with serious comorbidities such as chronic kidney disease, congestive heart failure, active tuberculosis, active infection, and previous or concomitant other malignancies were excluded.

Patient demographics were extracted from medical records, including staging, type of treatment, response to treatment, date of relapse, or deceased.

Multidisciplinary team meeting (MDTM) and care for patients with NPC

Our institution implemented and supported head and neck multidisciplinary meetings since 2016. The NPC MDT members consist of otorhinolaryngology head and neck surgeons, medical oncologists, radiation oncologists, radiologists, pathologists, general practitioners, data managers, nurses, allied staff, and attending students. The NPC MDT has a weekly meeting schedule, that is held to discuss new patients, verify diagnosis, staging, and treatment decisions based on hospital and national guidelines. The goals of the MDTM are to improve the capability to diagnose, increase accuracy in staging procedures, and improve treatment outcomes. To date, the presentation of patients with NPC in MDTM has been filed by their attending oncologist.

The new patients with NPC submitted and treated with the MDTM from 2016 to 2020 were designated as the MDTM group, while the remaining patients NPC whose treatment decisions were not made by the MDTM were determined as the group handled without MDTM. Patients without the MDTM were treated through the conventional services; they went to subsequent oncology services based on referrals by their attending oncologist. All treatment decisions for NPC patients in the group treated without the MDTM approach were decided by the attending oncologist.

Treatment for NPC

According to national and international guidelines for NPC, stage I is treated with intensity-modulated radiotherapy (IMRT); stage II is treated with IMRT or with concurrent chemoradiotherapy (CCRT) for the high-risk relapsed group; stage III is treated with CCRT or induction chemotherapy (ICT) followed by CCRT or CCRT followed by adjuvant chemotherapy (AC); stage IVA is treated the same as stage III (for N3 disease, IC, or AC should be added to CCRT); and stage IVB is treated with chemotherapy and radiotherapy on tumor or nodal sites.[4]

The IMRT treatment consists of a total dose IMRT of 70 Gy, with 2 doses per fraction for 33 fractions. The CCRT uses low dose cisplatin 40 mg/m^2/week concomitantly with radiotherapy. The ICT is given before CCRT and includes multiple agents, such as docetaxel/cisplatin/5-FU (TPF) or cisplatin/5-FU. Adjuvant chemotherapy following CCRT is cisplatin/5-FU or carboplatin/5-FU.

Chemotherapy and radiotherapy (CRT) consist of 4 to 6 cycles of chemotherapy followed by radiotherapy or vice versa, for metastatic NPC. All treatments that did not follow the guidelines were categorized as treatment modifications.

Clinical endpoints

Response assessments were made at 12 weeks after completion of treatment and every 3 months for the first 2 years and every 6 months for the following years.

Clinical responses are reported as complete response (CR), partial response (PR), stable (SD), and progressive disease (PD).[13] The disease control rate (DCR) describes the percentages of patients with CR, PR, and SD. The objective response rate (ORR) is defined by the percentage of patients with CR and PR.[14]

The date of the first event of progression and date of death were collected. Progression-free survival (PFS) was defined as the time from diagnosis until first evidence of disease progression or death. Overall survival (OS) was defined as the time from diagnosis to death.[14]

Lost to follow-up was defined when patients did not present to the hospital or could not make any contact for ⩾1 year. Patients who were lost to follow-up at the time of evaluation

were censored. Patients with documented disease progression who were lost to follow-up at the time of evaluation were defined as having an event.

Sample calculation

For survival analysis, sample size was calculated based on a proportional-hazard regression model.[15]

α two tailed = 0.05; β = type two error rate = 0.2

The standard normal deviation for $\alpha = Z\alpha = 1.96$,

The standard normal deviation for $\beta = Z\beta = .84$.

q1 = proportion of subjects in MDTM group = 0.5;

q0 = proportion of subjects in group without MDTM;

Relative hazard (RH) group with MDTM/without MDTM = 0.5

$A = (Z\alpha + Z\beta)^2 = 7.85$;

$B = (\log (RH))^2 q0q1 = 0.1201$

Total events needed for analysis = A/B = 65 events.

The median survival time of patients with NPC in a previous report was 1.5 year, censoring rate = 0.6; the follow-up time was estimated to be 2 years, and the total sample size was 214 patients.

Data collection and analysis

Data were analyzed with chi square tests for discrete variables and t-tests for continuous variables. Kaplan-Meier survival curves with log-rank tests were used to describe the difference in survival estimation between the groups.[16] Statistical methods for analysis included Cox proportional hazard regression and likelihood ratio (LR) chi square-tests. Analysis of survival was used to estimate the hazard ratio (HR), with associated 95% confidence intervals (CI) and *p* values. For all analyses, a *P*-value $<.05$ was interpreted as statistically significant. Data analysis was performed using SPSS version 24 (IBM Corp., Armonk, NY).

Results

During the study period (31 months), there were 265 patients diagnosed with NPC; 87 patients were treated in the MDTM group, and 178 patients were handled without the MDTM approach. The mean duration of follow-up in the recent study was 19.61 ± 14.76 months. The MDTM group had a longer duration of follow-up than those without MDTM (mean = 24.60 ± 13.77 months vs 17.17 ± 14.65 months, $P < .001$).

The median age of patients with NPC was 49.00 years (ranging from 12 to 82 years). The mean age of patients in the MDTM group was 50.60 ± 11.71 years compared to 47.06 ± 10.40 years for those without MDTM ($P = .013$). There were more males in both groups (69.0% of patients in the MDTM group and 71.9% without MDTM, $P = .62$). Undifferentiated nonkeratinizing squamous cell carcinoma was predominant with as many as 261 out of 265 (98.5%). The differentiated, nonkeratinizing type was found in only 4 patients (1.5%). A similar distribution of histology type was found in both the MDTM group and the group without MDTM ($P = .46$).

There were 188 (70.94%) NPC patients with complete staging assessment written on medical records. There were 8 (3.02%) patients with stage I disease, 21 (7.92%) patients had stage II disease, 44 (16.60%) patients had stage III disease, 90 (33.96%) patients had stage 4 A disease, and 25 (9.43%) had stage IVB disease. There were 77 patients (29.05%) missing their disease stage due to a lack of data.

Stages IVA and B accounted for 62.10% of patients in the MDTM group and 34.1% in the group without MDTM. There was no difference in stage distribution between the 2 groups ($P = .140$). Information on stage was missing in 73 (41.0%) patients in the group without MDTM compared to only 4 (4.5%) patients from the MDTM group. Table 1 shows the characteristics of patients with NPC managed with the MDTM approach compared to the group without MDTM.

Multidisciplinary meeting (MDTM) care and quality of cancer care

Verification diagnosis and staging during the MDTM process. During the MDTM, revisions of diagnosis and staging accounted for 5.7% and 52.3% of presented cases, respectively. In general, the number of visits was similar among patients cared for with MDTM and without MDTM (mean = 19.86 ± 13.49 times vs 24.24 ± 23.71 times, $P = .11$). When only visits for surveillance and tumor assessment were taken into account, patients treated with MDTM had more frequent visits than patients without MDTM (mean = 3.53 ± 1.89 times vs 2.01 ± 3.13 times, $P < .001$).

There were fewer incomplete data regarding the stage of disease among patients with MDTM compared to patients treated without MDTM (4.6% vs 41.0%, $P < .001$).

Patients who dropped out during their cancer care were high, accounting for 16 patients (18.2%) in the MDTM group and 43 patients (24.6%) in the group managed without MDTM. There was no significant difference between the 2 groups ($P = .289$) in terms of loss to follow-up.

Adherence to national/local guidelines for NPC management. There were more cases in the MDTM group that had been treated according to national/local guidelines for NPC management compared to the patients in the group treated without MDTM (64.4% vs 22.5%; $P < .001$). Treatment modifications were still found in 29 patients (33.3%) in the MDTM group, while as many as 90 (50.6%) patients in the group treated without MDTM had modification of their treatment ($P < .001$).

Table 1. Baseline characteristics of patients with nasopharyngeal cancer (NPC) treated with MDTM care versus without MDTM care.

CHARACTERISTICS	WITH MDTM (N = 87)	WITHOUT MDTM (N = 178)	*P*-VALUE*
Age (y; median ± IR)	50.0 ± 17	47.0 ± 10.4	**.013**
Sex			
Male	62 (69.0)	128 (71.9)	.620
Female	27 (31.0)	50 (28.1)	
Histological type			.461
WHO I/II	2 (2.3)	2 (1.1)	
WHO III	85 (97.7)	176 (98.9)	
Stage (AJCC 8th ed.)			.140
1	1 (1.1)	7 (3.9)	
2	6 (6.9)	15 (8.4)	
3	23 (25.3)	22 (12.4)	
4A	44 (50.6)	46 (25.8)	
4B	10 (11.5)	15 (8.4)	
Unknown	4 (4.6)	73 (41.0)	

Values are expressed as number (%) or mean ± standard deviation.
AJCC 8th ed.—The eighth edition American Joint Committee of Cancer; IR, interquartile range; MDTM, multidisciplinary team meeting.
*Calculated with Pearson chi square tests, $P < .05$ was considered statistically significant (bold-faced).

Table 2. Clinical responses of patients with NPC according to multidisciplinary team meeting (MDTM).

CONDITIONS	WITH MDMT (N = 87)	WITHOUT MDTM (N = 178)	*P*-VALUE*
Clinical response			
CR	29 (33.3)	20 (11.2)	
PR	21 (24.1)	23 (12.9)	
SD	10 (11.5)	14 (7.9)	**.000**
ORR (CR, PR)	50 (57.5)	43 (24.2)	**.000**
DCR (CR, PR, SD)	60 (69)	57 (32.0)	**.000**

Abbreviations: CR, complete response; DCR, disease control rate; NPC, nasopharyngeal cancer; ORR, objective response rate; PR, partial response; SD, stable disease.
Values are expressed as number (%) or mean ± standard deviation.
*Calculated with Pearson chi square tests, $P < .05$ was considered statistically significant (bold-faced).

Clinical response with MDTM care

In the MDMT group, CR to first-line treatment was achieved in 29 (33.3%) patients, while PR and SD were achieved in 21 (24.1%) and 10 (11.5%) patients, respectively. In the group treated without MDTM, CR was achieved in 20 (11.2%) patients, while PR and SD were achieved in 23 (12.9%) and 14 (7.9%) patients, respectively. There were more progressive diseases in patients in the group treated without the MDTM than in patients in the group treated with MDTM (68% vs 31.0%). The ORR was 57.5% in the MDTM group compared to 24.2% in the group without MDTM ($P < .001$). The DCR was also higher in the MDTM group (69.3% vs 32.0%, $P < .001$). Table 2 describes the clinical responses between 2 groups.

Impact of MDTM care on the survival of patients with NPC

Progression-free survival (PFS). There were 27 patients with NPC (31.0%) in the MDTM group who had disease progression during observation, leaving 69.0% of the remaining patients censored. The median PFS was 59.89 months (95% CI 23.35-96.430). There were 145 NPC patients in the group treated without MDTM who had disease recurrence or progression, with a median time to progression of 12.684 months (95% CI 11.142-14.225). There was an increased risk for progression for patients treated without MDTM (HR 3.752, 95% CI 2.485-5.662, $P < .001$) compared to those treated with MDTM.

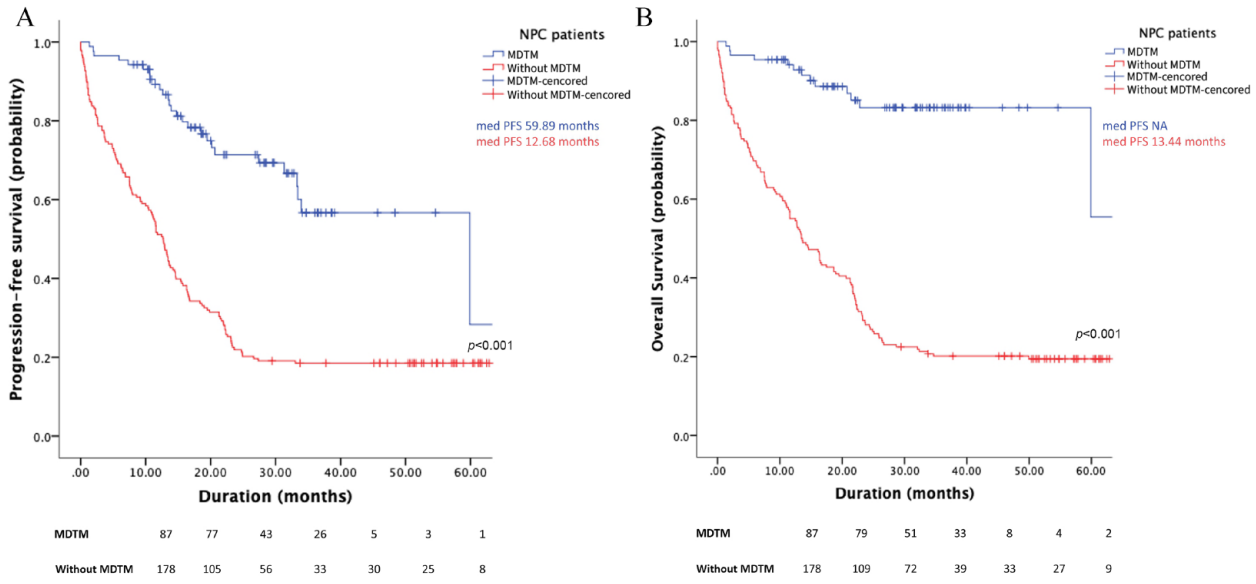

Figure 1. Survival estimation curves of patients with NPC based on the use of multidisciplinary meeting (MDTM): (A) progression-free survival and (B) overall survival. Data were analyzed with the log-rank test, and $P < .05$ was defined as statistically significant.

Overall survival (OS). There were 13 deaths in the group treated with MDTM during observation and 143 deaths in the group without MDTM. The mean survival time in the MDTM group was 56.272 ± 2.884 months compared to 21.748 ± 1.655 months in the group without MDTM. NPC patients who never received recommendations from the MDTM had a higher risk for mortality (HR 3.881, 95% CI 2.550-5.696, $P < .001$). Figure 1 describes the effect of MDTM on the survival of NPC patients.

Patient management under MDTM as a prerequisite for improving the survival of patients with NPC. Recurrence or progression and mortality of patients with NPC are determined by several factors, such as age, clinical stage, treatment of primary cancer, ORR to first-line treatment, and various exploratory biomarkers. A Cox proportional hazard model was performed to determine the HR of each variable for influencing the survival of either PFS or OS. There were 5 variables that were assumed to predict better survival: younger age (⩽50 years old vs >50 years old), stage of disease (stage I vs stage II, III, IVA vs stage VB), first-line treatment (CCRT ± IC/AC vs CRT vs treatment modification), clinical response (ORR was achieved vs ORR was not achieved) and involvement of MDTM (MDTM vs outside MDTM). Table 3 describes the HR for assumed variables for predicting progression and death based on bivariate and multivariate analyses.

Age >50 years (HR 1.937, 95% CI 1.431-2.621, $P = .000$), never presented with MDTM (HR 3.752, 95% CI 2.485-5.662, $P = .000$), unable to achieve ORR (HR 2.410. 95% CI 1.705-3.407, $P = .000$) and treatment without CCRT (HR 1.7562, 95% CI 1.162-2.671, $P < .008$) were all associated with a higher risk for progression based on the bivariate analysis. After multivariate analysis, variables associated with PFS were older age, cases without MDTM, unable to achieve ORR and advanced stages.

Risks for worse OS were associated with older age (HR 3.577, 95% CI 2.511-5.096, $P = .000$), cases without MDTM (HR 9.658, 95% CI: 5.378-17.343, $P = .000$), unable to achieve ORR (HR 2.636, 95% CI: 1.772-3.919, $P = .000$), and advanced stage (HR 5.907, 95% CI: 1.857-18.797, $P < .003$). Similar variables were consistently associated with both PFS and OS.

Concurrent chemoradiation was significantly associated with better PFS and OS in the bivariate analysis than sequential CRT or treatment modification but was not significantly associated with PFS and OS after the multivariate analysis. For selected patients with stage II, III, and IVA disease, treatment modalities with CCRT either with or without IC/AC resulted in a longer mean PFS than CRT or other treatment modalities (34.225 ± 3.027 months vs 20.187 ± 3.292 months vs 26.237 ± 2.556 months, respectively; $P = .007$) and a longer mean OS (41.267 ± 3.201 months vs 22.252 ± 3.487 months vs 28.443 ± 2.581 months, respectively; $P = .001$).

Discussion

Multidisciplinary cancer teams (MDTs) are commonly accepted as the gold standard of cancer care.[17] The concept of MDT care was introduced more than 20 years ago to improve quality, timely coordination, and delivery of care. MDTs are now a mandatory component of cancer care and are regulated through the annual peer review process, which ensures adherence to national tumor-specific guidelines with the aim of standardizing and improving the outcomes of patients with cancer. Today, MDTs are becoming increasingly prevalent globally. In our center, MDT for NPC management was initiated from 2005 to 2009, but due to a lack of professional staff commitment, MDTM was not routinely performed on a weekly basis. It was started again in 2016 and is now regular and well organized, with attendance of all attending and consulting oncologists, radiologist, pathologists, and nurses. All

Table 3. Variables associated with progression-free survival (PFS) and overall survival (OS) of NPC patients.

VARIABLE	PFS				OS			
	BIVARIATE		MULTIVARIATE		BIVARIATE		MULTIVARIATE	
	HR (95% CI)	*P**	HR (95% CI)	*P**	HR (95% CI)	*P**	HR (95% CI)	*P**
Age (y)								
⩽50	1 (reference)		1 (reference)		1 (reference)		1 (reference)	
>50	1.937 (1.431-2.621)	**.000**	2.910 (2.093-4.045)	**.000**	1.974 (1.436-2.712)	**.000**	3.577 (2.511-5.096)	**.000**
Group of caring								
With MDTM	1 (reference)		1 (reference)		1 (reference)		1 (reference)	
Without MDTM	3.752 (2.485-5.662)	**.000**	4.469 (2.910-6.863)	**.000**	7.489 (4.242-13.223)	**.000**	9.658 (5.378-17.343)	**.000**
ORR (CR, PR)								
Achieved	1 (reference)		1 (reference)		1 (reference)		1 (reference)	
Other	2.410 (1.705-3.407)	**.000**	2.131 (1.494-3.039)	**.000**	2.917 (1.984-4.288)	**.000**	2.636 (1.772-3919)	**.000**
Stage								
I	1 (reference)		1 (reference)		1 (reference)		1 (reference)	
II, III, IVA	1.880 (0.696-5.080)	.213	3.393 (1.247-9.233)	**.017**	2.460 (0738-7.733)	.123	5.907 (1.856-18.797)	**.003**
IVB	2.724 (0.929-7.991)	.068	2.696 (0.919-7.915)	.071	3.327 (0.978-11.318)	.054	3.829 (1.126-13.027)	**.032**
Treatment modalities								
CCRT (±IC/AC)	1 (reference)		1 (reference)		1 (reference)		1 (reference)	
CRT	1.762 (1.162-2.671)	**.008**	0.911 (0.578-1.436)	.689	2.100 (1.348-3.271)	**.001**	0.859 (0.536-1.376)	.527
Treatment modification	1.359 (0.959-1.926)	.085	0.844 (0.575-1.239)	.387	1.630 (1.119-2.375)	**.011**	0.866 (0.576-1.300)	.487

Abbreviations: AC, adjuvant chemotherapy; 95% CI, confidence interval; CCRT, concurrent chemoradiotherapy; CR, complete response; CRT, chemotherapy followed by radiotherapy sequentially; HR, hazard ratio; IC, induction of chemotherapy; ORR, objective response rate; OS, overall survival; PFS, progression-free survival; PR, partial response.
*Analysis was calculated by Cox regression proportional hazard model with $P < .05$ considered statistically significant (bold-faced). All variables with $P < .125$ from bivariate analysis were included in the multivariate model.

cases presented in the meeting are discussed, and the results documented in both patients' electronic medical records and MDTM files by MDTM coordinators.

With the MDTM approach, there were substantial improvements in the quality of cancer care. All pathological diagnoses were verified by an MDTM pathologist. Correction of diagnosis was made in 5.7% of presented cases. Staging was verified by the MDTM radiologist, and stage corrections were made for more than half of the presented cases in the MDTM. The reason for most of the correction was that the initial reports, which were read by non-head and neck radiologists, did not incorporate descriptor compatible to AJCC eighth staging system. Prior to using the MDTM approach, all radiological examinations were re-evaluated by head and neck radiologists in accordance to the staging system, and staging revisions were verified. The benefit of the MDTM on the accuracy of the staging process was also highlighted by Licitra et al.[8] Alteration of the treatment plan occurred in 23.1% to 41.7% of cases, and MDT decisions were implemented in 90% to 100% of evaluated cases.[18]

The meetings were also attended by medical students and trainees for education and research purposes. Trainees shared medical information but did not make the clinical decision.[19] Other specialists, such as dentists, physiotherapists, psychosomatic specialists, geriatric specialists, and nutritionists, did not routinely join the meeting, but they were invited to join when selected cases needed their specialties. Taberna et al[20] reported the functions and roles of these supportive subspecialties.

Adherence to national/hospital guidelines was well maintained in the MDTM group compared to the non-MDTM group. Similar results were reported by previous studies.[8,21]

Treatment without CCRT was associated with poorer survival compared with CCRT in the univariate analysis, but there was no significant difference after the multivariate analysis. Different treatment approaches such as adding induction before CCRT, CRT, or treatment modification were not associated with survival. Similar results were reported by Ou et al[22] that indicated achieving clinical response after chemotherapy and radiation treatment was a better indicator for survival.

Incomplete data regarding staging were more common in the group without MDTM, and it could be seen in the reports that during MDTM, verification of the diagnosis and staging was always performed.

The loss to follow-up rates were similar between the group treated with MDTM and those without MDTM due to decreasing visits during the pandemic in 2020 to 2022.

Higher response rates were achieved by patients who presented with MDTM, as also reported by previous studies.

The advantages of incorporating MDTM and MDT care in the survival of patients with cancer were reported by previous studies, similar to this study. Progression-free survival and OS were also reported to be positively affected by MDTM care in recent studies.[7,23,24]

The findings of this study should be interpreted in the light of several limitations. One main limitation of the study is related to the retrospective design, since some important factors associated with progression or survival could not be extracted from the patients' electronic medical records. Data on psychological status, comorbidities, and patients' and family wishes and preferences could also not be reported from the recent study. Wihl et al[25] similarly reported that psychological factors and nonmedical factors such as family relations, occupation, country of origin and patient preference were referred to in less than 10% of cases in MDT discussions. Accordingly, there is a need to define data elements and develop better reporting standards for MDTM to support MDTM decision-making.

Patients' failure to attendance for surveillance visits due to health protocol regulations during the SARS-CoV-2 pandemic influenced the high rate of loss to follow-up. Patients presented to the MDTM as referred by their oncologist; therefore, the number of patients seen in the MDTM was lower than the number of patients treated without the MDTM. During this time, communication between professional members of the MDTM generally worked well. Meetings used a hybrid platform that enabled all of the contributing members to join and participate in the decision-making.

There were some challenges in conducting MDTM, such as commitment to attending regular meetings and referring patients with cancer who could benefit from MDTM, assigning the role of the MDTM board to ensure diversity and equal opinion from all different specialties, with an open-minded and blame-free culture, and tailoring MDT care as a well-organized and efficient service, especially for very busy cancer clinics with a small number of subspecialty members.[26] Arranging the in-charge personnel with substitutes with the same level of competence should be prepared before the MDT team is initiated. Adjustment of the cost of health services to proceed with MDTM should be well calculated if all new patients are presented with MDTM. The efficient MDTM should be patient-centered, along with advances in molecular pathology, clinical trials and patient-reported outcomes.[17,27] The use of advanced clinical decision systems showed excellent promise to support MDTs.[11]

The MDT in a hospital can be expanded to a hub-and spokes model to position the specialized MDT unit as a hub and build the network with surrounding hospitals as spokes to improve and empower cancer care.[9]

Recently, some of our data managers in NPC MDT started their tasks as patient navigators to assist and assess patients' needs and problems during their oncologic journey. The patient navigators help to ensure patients adhere to their treatment plan.[9,28,29] Incorporating these patient navigators into our MDT model will improve the overall quality of care.

Some important implications of the recent study are to provide empirical evidence to the government and healthcare authorities that incorporating the MDTM approach can improve quality of care, upgrade the communication and education between subspecialists, and extend the survival of patients.

Conclusions

The multidisciplinary cancer meeting has greatly improved the cancer care process for patients, physicians, and the community. If implemented appropriately, these multidisciplinary cancer meetings have the potential to enhance the quality of care and improve the survival of patients.

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Author Contributions

KWT, CH, WD, and SPL made substantial contributions for the conceptualizing and designing of the study. YW and HP performed data collection. KWT, HP, RR worked on the analysis and interpretation of the data. KWT wrote the manuscript. All other authors took part in drafting the article or revising it critically for important intellectual content. All authors have read and agreed to the final version of the manuscript.

Consent for Publication

Not applicable.

Ethic Approval and Consent for Participate

Ethics approval for this retrospective study was granted by the Joint Ethics Committee of Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada and Dr. Sardjito Hospital (number KE/FK/1128/EC/2019). All methods were conducted in accordance with the guideline of the Declaration of Helsinki. Informed consent for participation was obtained from all the study participants and their parent/legal guardian(s).

Availability of Data and Materials

The deidentified data used and analyzed during the current study are available from the corresponding author on reasonable request.

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