

Use of Performance Status Score for Cytotoxic Chemotherapy among Surgeons in a Tertiary Hospital, Southern Nigeria

Abstract

Introduction: Performance score evaluation is a tool for assessment of patients prior to cytotoxic chemotherapy administration. It has also been used to modify and personalize the dosage, route and types of the various chemotherapeutic agents

Aim: The present study was aimed at evaluating the use of performance status as assessment tool for patients on cytotoxic chemotherapy.

Study design: This study is a questionnaire survey involving all doctors in the Department of Surgery of the University of Benin Teaching Hospital, Benin City, Nigeria. The returned questionnaires were individually inspected for clarity of responses and collated. The data was entered into excel sheets. Forms which were incomplete, poorly filled or not returned were not included in the study. All the data entered into the spreadsheets were analysed using the SPSS 20 package.

Results: A total of 64 (70%) doctors were enlisted in the study. Though 73.4% had knowledge about the use of performance status in the assessment of oncology patients, only 62.1% could name any type of performance status. Most respondents agreed that they would reduce the chemotherapeutic dosage in response to a poor PS score. Routine use of PS should be emphasized as it enhances patients' care, brings measurable objective assessment to bear on the process of both palliative and potential curative measures.

This study focused on the practice amongst doctors, however PS may be routinely measured by nurses both in the clinic or wards when these patients present.

Conclusion: The awareness of performance status score is high however its uptake in clinical practice was low requiring further development and adherence to established protocols.

Keywords: Cancer, cytotoxic chemotherapy, Nigeria, Performance Status

Introduction

Performance score evaluation is a tool for assessment of patients prior to cytotoxic chemotherapy administration¹. It allows the oncologist (Clinical/Medical, Radiation or Surgical) to prognosticate and thus adequately assess the benefit of administration of chemotherapy to cancer patients². It has also been used to modify and personalize the dosage, route and types of

the various chemotherapeutic agents^{1,2,3}. The first performance score was devised by Karnofsky and his colleagues in 1948 for evaluating primary lung cancer patients undergoing chemotherapy with nitrogen mustard agent⁴. This score derived from a scale that comprised from 0 – 100; with 0 (death) and 100 (normally active). It had 11 scores or ranks. This performance score gained ascendancy in use till 1960 when the Eastern Co-operative Oncology Group (ECOG) introduced a simpler 'ECOG performance status' scale, which had 5 points⁵. This was subsequently modified by the addition of the 5th point (death). The ECOG is also known as the WHO performance score. The Lansky is a modification of the Karnofsky but used in children². It has the same ranks or points. Studies have shown that the Karnofsky Performance Score is interchangeable with ECOG(WHO) and Lansky scores with the ECOG(WHO) 0-1 equals Karnofsky 80-100, ECOG(WHO) 2 equals Karnofsky 60-70, ECOG(WHO) 3-4 equals Karnofsky 10-50⁶. Though inter-observer differences have been demonstrated, it has not invalidated the scores nor diminished its importance in assessment of patients for chemotherapy^{7,8,9}.

Performance status (PS) may be assessed by the attending physician, the nurse, the psychiatrists or even the patient, thus it does not require much training to commence its use. Since it provides a simple objective means to assess the patients' functional state, its routine use has demonstrated benefits to this subset of patients. Assessment and evaluation of patients in clinical settings where its use is routine has shown that patient benefit is ensured with reduced incidence of morbidity and even mortality from chemotherapy administration encountered in such patients^{1,2}. It also has demonstrated good prognostic value in the overall patient evaluation³.

Our study was aimed at evaluating the use of performance status as assessment tool for patients on cytotoxic chemotherapy in Surgery Department, University of Benin Teaching Hospital, Benin City.

Materials and Methods

This is a questionnaire survey involving all doctors in the Department of Surgery of the University of Benin Teaching Hospital, Benin City, Nigeria. The hospital is a regional tertiary care center involved in the management of patients mainly from the Niger Delta Region. It is a 720-bedded hospital with various subspecialties in Surgery and a center for training of surgical residents in the West African College of Surgeons and the National Postgraduate Medical College. The surgical residents are trained in General Surgery (including gastroenterology, endocrine, oncology and hepatobiliary surgery), Plastic surgery, Orthopaedics, Cardiothoracic and Vascular Surgery, Paediatric Surgery, Neurosurgery and Urology. All subspecialties are involved in the care of malignancies in their respective patients. This care includes the provision of adjuvant and neoadjuvant chemotherapy. Performance status score being a veritable means of evaluation of patient on chemotherapy, all the doctors in the department were approached individually to fill a self administered Knowledge, Attitude and Practice form developed by the authors. There were 24 consultants, and 60 residents in the department. The residents comprised, Registrars and Senior Registrars. The registrars were entry level residents who are in

their first rotations pending the Part 1 examinations in the Faculty of Surgery of the two colleges, whilst the Senior Registrars were those in their final rotations for the Fellowship final examinations. The questionnaire detailed their knowledge, attitude and practice of the use of performance status evaluation. It consisted of three items on biodata, six on knowledge, four on attitude and five on practice as regards the use of performance status and scoring of patients undergoing chemotherapy.

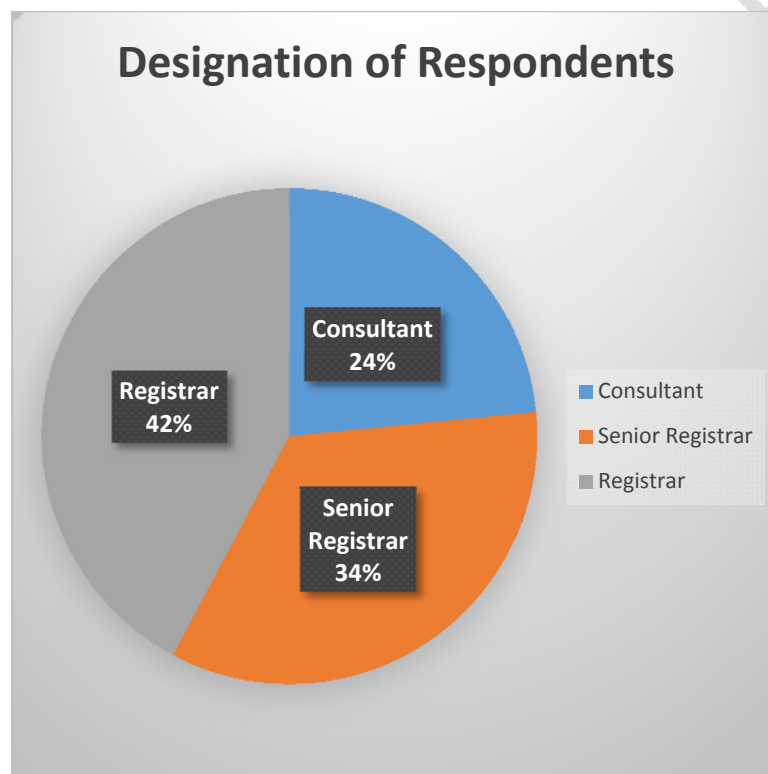
The returned questionnaires were individually inspected for clarity of responses and collated. The data was entered into Microsoft excel sheets. Forms which were incomplete, poorly filled or not returned were not included in the study.

All the data exported into the IBM SPSS Version 20.0 software and analysed.

Results

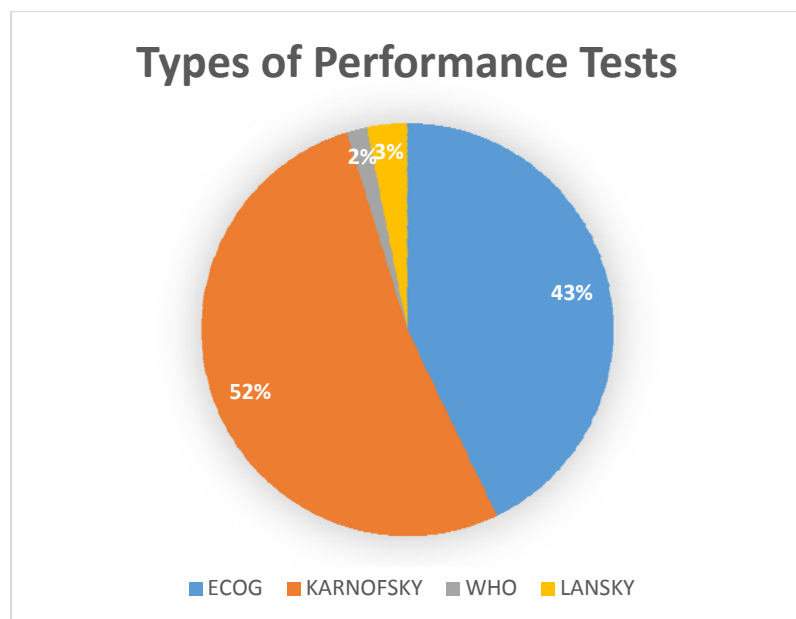
A total of 64 doctors were enlisted in the study, with a 70% response rate. 24% were Consultants, 34% were Senior Registrars and 42% were Registrars. Fig 1

Figure 1 showing the total percentage of respondents according to cadre.



The Karnofsky and ECOG were the two commonest PS test known by respondents. Fig 2

Figure 2 showing the types of Performance testing known by respondents



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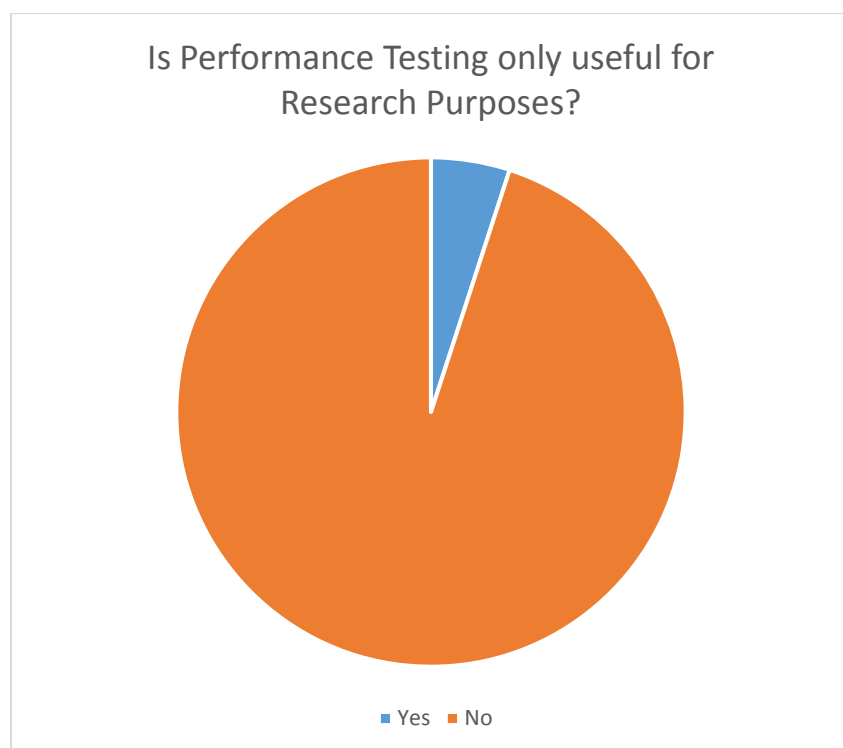
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95 The respondents(57,95%) agreed that PS was not just a research tool. Fig 3

96 Figure 3 showing responses to the question, "Is Performance Testing only useful for Research
97 Purposes?"



Knowledge about WHO PS was 73.3% of Consultants, 40.9% of Senior Registrars, 22.2% of Registrars. Overall, only 34.4% of respondents routinely used PS these comprised 33.3% among Consultants, 31.8% among Senior Registrars and 22% among Registrars. Table 1

Most of the respondents would adjust the dose of chemotherapeutic agents based on the PS, which are 60% among Consultants, 59.1% among Senior Registrars and 37% among Registrars. Table 1

Table 1 showing the responses to 4 questions on Knowledge and Practice concerning Performance Status

Knowledge and Practice of PS	Consultants (n = 15)	Snr Registrar (n = 22)	Registrars (n = 27)	Total (n = 64)	CHI Square p-value
Heard of performance status					
Yes	12(80.0)	18(82.0)	17(63.0)	47(73.4)	0.267
No	3(20.0)	4(18.0)	10(37.0)	17(26.6)	
Knew that WHO has a performance testing for cancer patients					
Yes	11(73.3)	9(40.9)	6(22.2)	26(40.6)	0.267
No	4(26.7)	13(59.1)	18(81.8)	35(54.7)	

Not sure	0(0.0)	0(0.0)	3(11.1)	3(4.7)	0.010
Routinely assess PS					
Yes	5(33.3)	7(31.8)	6(22.2)	18(28.1)	
No	10(66.7)	11(50)	18(81.8)	39(60.9)	
Not sure	0(0.0)	4(18.2)	3(11.1)	7(10.9)	0.112
Reduced dosage of chemotherapeutic agents because of poor PS score					
Yes	9(60.0)	13(59.1)	10(37.0)	32(50)	
No	4(26.7)	4(18.2)	11(40.7)	19(29.7)	
Not sure	2(13.3)	5(22.7)	6(22.2)	13(20.3)	0.382

*Percentages in brackets

Of the 47 respondents who knew about PS, only 38.1% routinely use it. Table 2

Table 2 showing a cross tabulation of routine use against knowledge.

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Routinely used the PS	Heard of Performance Status		Total	CHI Square p-value
	Yes	No		
Yes	18(38.3)	0(0.0)	18(28.1)	
No	27(57.4)	12(70.6)	39(60.9)	
Not sure	2(4.3)	5(29.4)	7(10.9)	
Total	47(100.0)	17(100.0)	64(100.0)	0.544

*Percentages in brackets

Only 40.6% of those who routinely use Performance Status, would reduce the dosage of chemotherapeutic regimen. Table 3

Table 3 showing a cross tabulation of routine use against reduction in dosage regimen.

Routinely assess the PS	Reduced the dosage of chemotherapeutic agents because of the poor Performance Score			Total	CHI Square p-value
	Yes	No	Not Sure		
Yes	13(40.6)	1(5.3)	4(30.8)	18(28.1)	
No	17(53.1)	14(73.7)	8(61.5)	39(60.9)	
Not Sure	2(6.3)	4(21.1)	1(7.7)	7(10.9)	
Total	32(100.0)	19(100.0)	13(100.0)	64(100.0)	0.573

*Percentages in brackets

Discussion

Awareness of Performance Status was fair across all cadres with consultants having a higher percentage. This is not unexpected however it was not universally used both in routine chemotherapeutic administration and in adjusting patients' dosage of regimens. It is probable that since most patients seen in our environment come in late stages where they appear moribund, the PS assessment is not the main consideration, rather clinicians may be pressed by the need to provide some therapy to these very poor cases rather than leave them if their PS is poor. This is not unconnected with the need to appear to care and to be doing their bit especially when patients and their relatives want to bear the risk of complications if their PS is not taken into cognizance. There would seem to be some disconnect between awareness and routine use of PS in our study that may be bridged by education, formal training, and establishment of clear standard operative protocols in the management of these subset of patients^{10,11}. Further studies to find out the reason for non routine use of PS is imperative to clarify this finding.

Most respondents agreed that they would reduce the chemotherapeutic dosage in response to a poor PS score. This is important as it has been demonstrated to reduce the incidence of morbidity and mortality associated with chemotherapy, for it ensures that the patient derives the greatest benefit from chemotherapy^{10,12,13}. Chemotherapy administration has been known to be associated with depression¹⁴, together with many cancer patients being already depressed by their diagnosis, dosage and route adjustment would likely result in less complications and make the chemotherapy more palatable to the patients. This is important because the quality of life is more important in end of life care for such patients.

Routine use of PS should be emphasized as it enhances patients' care, brings measurable objective assessment to bear on the process of both palliative and potential curative measures. It allows for measurable assessment of patients' benefit from chemotherapy. It also directs the decision on the patient care plan towards areas of resuscitation, stabilization and quality of life.

This study focused on the practice amongst doctors, however PS may be routinely measured by nurses both in the clinic or wards when these patients present. Patients themselves can be

taught and made to do a self assessment and indeed some studies have shown that they may be the better assessors of their functional state. Some studies have focused on the use of wearable devices by patients to further make the assessment more objective^{11,12}. The importance of this is that, in a busy practice, a protocol can be developed where the PS may be routinely measured by other healthcare providers and or the patient and charted thus helping to ensure use¹⁰.

Prognostic value of PS is in adjustment of chemotherapy dosage, route and sequence^{10,11}. The value of PS in prognosis of cancer patients on chemotherapy has been established by various studies^{1-9, 11,14}. Our study showed that only 38.3% of those who knew about PS using it routinely whereas 50.7% of them reported that they do not routinely use PS in the clinical management of their patients. Though this was not statistically significant, it however shows that either knowledge has not caught up with practice or other factors including clinical assessment has greater premium in the placement on chemotherapy. This is further demonstrated as 53.1% of those who would reduce dosage of medications based on PS do not routinely use it in their clinical practice. Further studies may be required to clearly establish the factors at play here, since overwhelmingly the respondents agree that the PS is not just a research tool but has importance in clinical practice.

It has shown that patients with poor scores may not benefit from some chemotherapeutic measures that may further depreciate their overall clinical condition.

Conclusion

The awareness of performance status score is high however its uptake in clinical practice was low requiring further development and adherence to established protocols.

Reference

1. Capewell S, Sudlow MF. Performance and prognosis in patients with lung cancer. The Edinburgh Lung Cancer Group. *Thorax*. 1990;45:951–956
2. Lansky SB, List MA, Lansky LL, Ritter-Sterr C, Miller DR (1987). "The measurement of performance in childhood cancer patients". *Cancer*. 60 (7): 1651–6. PMID 3621134. doi:10.1002/1097-0142(19871001)60:7<1651::AID-CNCR2820600738>3.0.CO;2-J.
3. Ando, M., Ando, Y., Hasegawa, Y., Shimokata, K., Minami, H., Wakai, K., Ohno Y, Sakai, S. (2001). Prognostic value of performance status assessed by patients themselves, nurses, and oncologists in advanced non-small cell lung cancer. *British Journal of Cancer*, 85(11), 1634–1639. <http://doi.org/10.1054/bjoc.2001.2162>
4. Karnofsky DA, Abelmann WH, Craver LF, Burchenal JH. The use of the nitrogen mustards in the palliative treatment of carcinoma. With particular reference to bronchogenic carcinoma. *Cancer*. 1948;1:634–656.

5. Oken MM, Creech RH, Tormey DC, Horton J, Davis TE, McFadden ET, Carbone PP. Toxicity and response criteria of the Eastern Cooperative Oncology Group. *Am J ClinOncol*. 1982;5:649–655.
6. Kelly CM, Shahrokni A. Moving beyond Karnofsky and ECOG Performance Status Assessments with New Technologies. *Journal of Oncology*. 2016;2016:6186543. doi:10.1155/2016/6186543.
7. Blagden SP, Charman SC, Sharples LD, Magee LRA, Gilligan D. Performance status score: do patients and their oncologists agree? *Br J Cancer*. 2003;89(6):1022-1027. doi:10.1038/sj.bjc.6601231.
8. Ando M, Ando Y, Hasegawa Y, Shimokata K, Minami H, Wakai K, Ohno Y, Sakai S. Prognostic value of performance status assessed by patients themselves, nurses, and oncologists in advanced non-small cell lung cancer. *Br J Cancer*. 2001;85:1634–1639
9. Liu MA, Hsieh T, Condrón N, Wadleigh M, Abel GA, Driver JA. Relationship between physician and patient assessment of performance status and survival in a large cohort of patients with haematologic malignancies. *Br J Cancer*. 2016 Sep 27; 115(7): 858–861. Published online 2016 Aug 23. doi: 10.1038/bjc.2016.260 . *British Journal of Cancer*. 2016 Aug 23; 115(7): 858-861
10. Sok M, Zavrl M, Greif B, Srpič M. Objective assessment of WHO/ECOG performance status. *Supportive Care in Cancer*. 2019 Feb 5:1-6.
11. Boland JW, Allgar V, Boland EG, Kaasa S, Hjermstad MJ, Johnson MJ. Predictors and trajectory of performance status in patients with advanced cancer: A secondary data analysis of the international European Palliative Care Cancer Symptom study. *Palliative medicine*. 2019 Feb;33(2):206-12.
12. Gresham G, Hendifar AE, Spiegel B, Neeman E, Tuli R, Rimel BJ, Figlin RA, Meinert CL, Piantadosi S, Shinde AM. Wearable activity monitors to assess performance status and predict clinical outcomes in advanced cancer patients. *npj Digital Medicine*. 2018 Jul 5;1(1):27.
13. Beg MS, Stewart T, Gupta A, Dong Y, Rahimi Z, Paul T, Crane K, Rethorst C. Feasibility of wearable physical activity monitors in cancer patients (PAMCaP).
14. Miwata K, Masuda T, Yamaguchi K, Sakamoto S, Horimasu Y, Miyamoto S, Nakashima T, Iwamoto H, Fujitaka K, Hamada H, Hattori N. Performance Status Is a Risk Factor for Depression before the Diagnosis of Lung Cancer Patients. *Internal Medicine*. 2019:1812-.