

IMPACT OF NEUTROPENIA IN CHEMOTHERAPY EUROPEAN STUDY GROUP

Launch of European Study Group for the Impact of Neutropenia in Chemotherapy (INC-EU)

Six oncologists from around Europe met for the first time in London in July 2002 to discuss neutropenia associated with adjuvant chemotherapy. The exchange of information revealed a wide variation in the recognition and management of this dose-limiting complication, which, throughout Europe, can affect up to 40% of patients.

The meeting marked the launch of the Impact of Neutropenia in Chemotherapy European Study Group (INC-EU) which is dedicated to furthering knowledge about, and to identify patient risk factors associated with, neutropenic complications so those specifically at high risk can be targeted for cost-effective supportive measures.

Identifying patients who may be at risk of developing chemotherapy-induced neutropenia is no easy task, largely because the appropriate data either has not been collected or is not in a form suitable for this type of analysis.

A group such as the INC-EU is well placed to conduct the research needed to identify patient risk factors associated with neutropenic complications and to produce a prospectively defined, point-of-care, risk-assessment tool for the cost-effective use of growth colony stimulating factors (G-CSF).

The INC-EU goals & objectives

Purpose

- Identify patient risk factors associated with neutropenic complications so high-risk patients can be targeted for cost-effective supportive measures

Goal

- Develop accurate prediction models for chemotherapy-induced neutropenia (CIN)
- Identification of patients at risk of CIN

Objectives

- Increase awareness of CIN
- Define the incidence and consequences of neutropenia and its complications
- Integrate economics into a practical, risk-assessment model
- Assess neutropenia-related Quality of Life and geriatric oncology issues

The INC-EU Study Group Members

Prof André Bosly

Head of the Department of Haematology
Cliniques Universitaires UCL, Godinne

Dr Manuel Constenla

Chief of Medical Oncology Service
Complejo Hospitalario de Pontevedra, Pontevedra

Dr Christian Jackisch

Associate Professor,
Department of Gynaecology
University of Marburg, Marburg

Prof Robert Leonard

Director of South West Wales Cancer Institute
Singleton Hospital, Swansea

Prof Robert Paridaens

Head of Clinic - Department of Oncology
University Hospital Gasthuisberg, Leuven

Dr Ruth Pettengell

Honorary Consultant,
Snr Lecturer in Haematology & Medical Oncology,
St George's Hospital, London

The INC-EU Co-ordinating centre

Wildmoor House, Wildmoor, Sherfield on Loddon,
Hook, Hants, RG27 0HD
t: +44 1256 884000
info@inceu.org

The Impact of Neutropenia

The Awareness of Neutropenia in Chemotherapy (ANC) study group was established in the United States in 2000 and has since been actively engaged in researching and publishing data.

The US ANC analysed records of 20,799 patients treated with adjuvant chemotherapy for early-stage breast cancer, from 1,247 community oncology practices. A key objective was to establish the incidence of low relative dose intensity (RDI), defined as <85% planned dose intensity, febrile neutropenia, defined as an absolute neutrophil count (ANC) <500/ μ l and temperature >38.2°C, and patterns of G-CSF use.

- Overall, 18% of patients received low RDI and 5.9% experienced febrile neutropenia.
- In general, low RDI was associated with CMF and CAF therapy, and with older age \geq 65 years).
- Elderly patients were more likely to experience high rates of febrile neutropenia, particularly if they had low baseline white blood cell counts (WBC) or ANC. An anthracycline doubled the risk of febrile neutropenia.

- About 27% of patients received G-CSF, with most treatment initiated around the expected time of nadir. Almost 70% of patients did not receive G-CSF until day 5 or after, and 32.4% received the drug for fewer than 5 days.

Conclusion: A significant number of patients treated for breast cancer - especially the elderly - receive lower-than-planned doses of chemotherapy and a smaller percentage develop febrile neutropenia. In addition, G-CSF is often used only after complications have developed. Predictive models based on the risk variables found in this large survey may eventually help identify patients who would benefit most from prophylactic G-CSF therapy.

Source: Lyman *et al.* Poster presentation 1571 at ASCO 2001.

Data reported in this newsletter and discussed at the INC-EU Study Group launch suggest that a similar pattern prevails in Europe, although the proportion of patients receiving a low RDI appears to be larger and that receiving G-CSF support considerably lower. There is also considerable inconsistency in the way in which G-CSF is used in Europe, despite many oncologists reporting that they follow ASCO guidelines.

European Experience in Breast Cancer

Germany

- Growth factor support generally not used according to international guidelines
- Dose reductions even during first cycle of chemotherapy
- Dose delays as early as second cycle and delays ≥ 16 days were common
- Dose delay/reduction more likely with concomitant radiotherapy
- Dose delay/reduction more likely rather than the use of G-CSF in clinical routine

In German clinical practices, around 85% of patients having adjuvant chemotherapy for primary breast-cancer receive more than 85% of the planned dose intensity, the results of a recent analysis show.

With concomitant radiotherapy, either before or during chemotherapy, a smaller proportion - less than 82% - achieved these dosage levels. Furthermore, growth factor support in these patients was often used sub optimally.

These findings, from a retrospective study of 175 patients in six German centres from 1991-99, confirm that chemotherapy-induced neutropenia may continue to affect treatment adequacy.

The women in the study had a mean age of 51.3 years and 51.5% of them were post-menopausal. Lymph node eradication was performed in all 165 who had undergone surgery, of whom 54.5% had had a mastectomy and 41.2% breast conservation. One hundred and fifteen patients (65.6%) received radiotherapy, the majority (54.6%) either before or during chemotherapy. The women received a total of 870 cycles of chemotherapy with either a CMF-like regimen (62% of patients) or anthracyclines as single agents or in various combinations.



Dr Christian Jackisch reviewing the German experience

Dr Christian Jackisch explained that dose reductions occurred even during the first cycle of chemotherapy. Dose delays were seen with the CMF-like regimens as early as the second cycle. By the fourth cycle, there were 'major problems in delivering the planned amount of chemotherapy' at which point the treatment was usually stopped.

Dose delays of ≥ 16 days were not uncommon with both the CMF-like and anthracycline regimens, Dr Jackisch said. Of the patients receiving a fourth cycle of CMF, a quarter did not receive 85% relative total dose intensity (RTDI). Unexpectedly, a higher proportion of patients on the anthracycline regimens achieved 85% RTDI although, he pointed out, the doses used were low: epirubicin, the most commonly used agent, was usually given at a dose of 50-60 mg every three weeks.

Radiotherapy timing is critical

When radiotherapy was given before or during chemotherapy 18.4% of patients did not reach 85% RTDI compared with only 8.2% of those who either did not receive radiotherapy at all or only after their chemotherapy. 'We have been surprised,' Dr Jackisch said, 'by the remarkable impact timing has on radiotherapy and chemotherapy in a multidisciplinary treatment approach.'

G-CSF tended to be used in the first two cycles. In addition, Dr Jackisch said, it was generally given only for one day, and only one to two days before the next cycle of chemotherapy at that time.

At the other extreme, a few patients, particularly those on CMF, received growth factors during their entire treatment.

These findings also show that, despite the superiority of anthracyclines as demonstrated in clinical trials, CMF remains not only more popular in routine practice, but also is more likely to be associated with dose delay and/or dose reduction. The additional dose delay and reduction seen with prior or concomitant radiotherapy shows the need for better communication with radiation oncologists to avoid jeopardising the potential benefits of treatment, he said.

Belgium

- G-CSF had a positive effect in patients receiving CMF and concomitant radiotherapy

In his presentation on two Belgian studies, Prof Robert Paridaens highlighted the increased risks of neutropenia in breast cancer patients receiving adjuvant chemotherapy with concomitant radiotherapy.

The analysis was conducted in patients treated with six cycles of a classical CMF regimen of whom some also received radiotherapy. Mean dose intensity progressively declined with each successive cycle but was consistently lower in those having concomitant radiotherapy, even during the first cycle of treatment.

Predictive model

'We tried to make a model to predict who would be at risk of having problems,' Prof Paridaens explained. A retrospective analysis of all (100) patients treated with adjuvant CMF from 1988-98 at the hospital revealed that the WBC count on day eight was a highly sensitive predictor for the intensity of subsequent treatment. A further retrospective analysis of the hospital's breast cancer database to determine the impact of dose intensity of adjuvant CMF on disease-free, and overall, survival showed that around three-quarters of patients achieved an RTDI of $\geq 85\%$.



Dr Robert Paridaens shared two Belgian studies

These results are ‘not all that bad’, Prof Paridaens pointed out.

Significant prognostic factors were, as would be expected, the number of positive nodes and whether the patient had had a mastectomy or breast-conserving surgery. Disease-free survival was significantly shorter for patients having a mastectomy, a high ANC on day eight of the first cycle and a high Nottingham Prognostic Index (NPI) score. Overall survival was also significantly shorter for patients with a high NPI score and a mastectomy.

G-CSF support strategies

Only about 5% of patients in this retrospective database received G-CSF support. But, in a subsequent prospective study, in breast cancer patients receiving adjuvant CMF with concomitant radiotherapy, the Leuven group examined whether or not the adequate use of G-CSF ‘could maintain dose intensity without having dangerous effects’. This phase 2 study investigated G-CSF used in patients who had already experienced one neutropenic event, rather than as primary prophylaxis where growth factor is given to all patients. Pre-emptive G-CSF is probably the more rational approach, Prof Paridaens said. The results showed that filgrastim had a ‘positive effect’ in patients receiving CMF and concomitant radiotherapy. ‘A significantly greater proportion of the patients could achieve a relative total dose intensity of higher than 90%.’ There was no obvious adverse impact of filgrastim on tolerance to either chemotherapy or radiotherapy both in the short and long term.

G-CSF support may be a better clinical and more cost-effective solution to the problem of chemotherapy-induced neutropenia when used pre-emptively rather than as primary or secondary prophylaxis, Prof Paridaens concluded.

Pre-emptive G-CSF could be given either after a first dose delay/reduction or from cycle two onwards to patients identified during cycle one as being at risk. The pre-emptive approach is cheaper than primary prophylaxis because it is confined to patients at risk, and is safer than secondary prophylaxis because patients do not need to develop febrile neutropenia before they are eligible for treatment.

The United Kingdom

- Fewer than half the patients with neutropenic events received >85% RDI
- Neutropenia delayed chemotherapy cycles by a mean of 7.5 days and reduced doses by a mean of 31% (CMF regimens) and 22% (anthracycline regimens)
- Of neutropenic patients, only 6% received G-CSF
- Among patients experiencing one neutropenic episode, a second episode was less likely in those given G-CSF



Prof Robert Leonard, “Dose delay was the most common response to neutropenia.”

The impact of neutropenic events on, and the potential of G-CSF to improve, RDI in breast cancer is also evident from the UK audit of breast cancer, reported by Prof Robert Leonard. The audit, conducted in 15 centres, included patients with stage IV as well as less advanced disease, but Prof Leonard confined his report to 422 patients having adjuvant therapy for operable disease.

The audit, conducted in 15 centres, included patients with stage IV as well as less advanced disease, but Prof Leonard confined his report to 422 patients having adjuvant therapy for operable disease.

Patients received a variety of chemotherapy regimens including:

- Cyclophosphamide/methotrexate/ 5-fluorouracil (CMF)
- Doxorubicin alone, doxorubicin/ cyclophosphamide (AC)
- Doxorubicin/CMF, 5-fluorouracil/ epirubicin/cyclophosphamide (FEC)
- Cyclophosphamide/doxorubicin/ 5-fluorouracil (CAF).

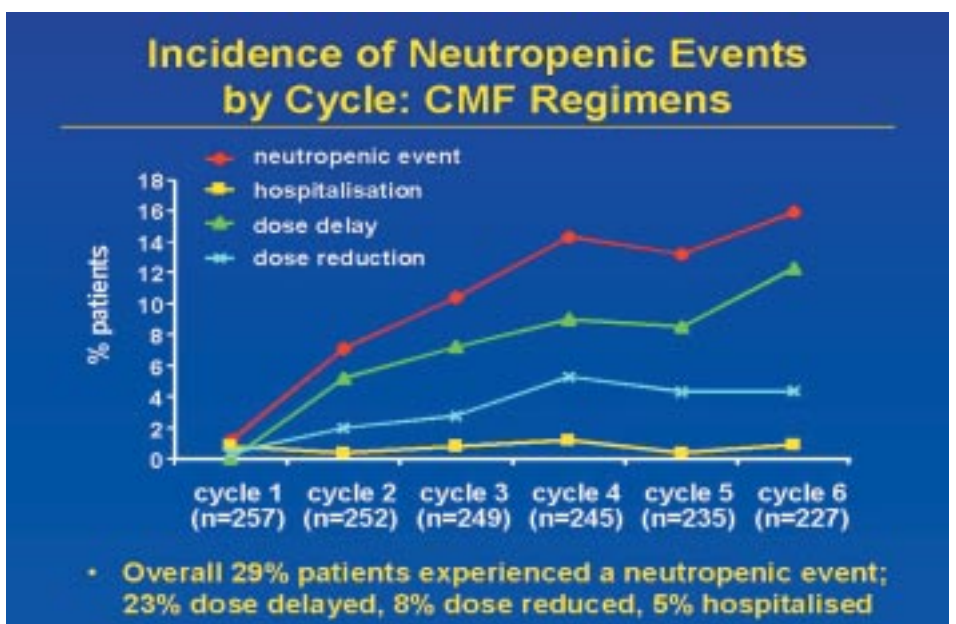


Figure 1

UK Experience in Lymphoma

- Neutropenic events had a significant impact on the ability to deliver the planned dose intensity
- Some use of G-CSF was inappropriate, ie, as treatment in patients who had been admitted to hospital because of neutropenia

In lymphoma, as in breast cancer, reduced dose and dose intensity during standard chemotherapy regimens have been shown to compromise outcome, explained Dr Ruth Pettengell. Myelotoxicity is a significant cause of these dose modifications and can be improved by G-CSF prophylaxis.

The objectives of the UK lymphoma audit were to:

- Record the incidence of neutropenic events in patients undergoing chemotherapy
- Evaluate the impact of these events on the overall dose intensity received
- Review the use of G-CSF and its impact on dose intensity

Neutropenic events were defined as:

- Hospital admission due to febrile neutropenia
- Dose delay ≥ 1 week due to neutropenia
- Dose reduction of $\geq 15\%$ due to neutropenia

The audit covered 177 patients:

- 130 with non-Hodgkin's Lymphoma (NHL)
- 47 with Hodgkin's disease (HD), of whom about 60% had advanced stage disease

The patients received a variety of regimens:

- CHOP (cyclophosphamide/ doxorubicin/vincristine/ prednisolone), PMitCEBO and ESHAP for the NHL patients

- ABVD (doxorubicin/bleomycin/ vinblastine/dacarbazine), ChIVPP/PABLOE, Stanford V, and ChIVPP/EVA for those with HD

Overall, approximately 43% of patients had a neutropenic event: 34% and 68%, respectively of those with NHL and HD. The mean age of patients with such events was higher than those without: 63.8 vs. 58 years for the NHL group and 39.7 vs. 30.3 years for those with HD. The incidence of neutropenic events among the NHL patients was also higher with weekly regimens such as PMitCEBO (51.7%) than with CHOP or CHOP-like therapy (approximately 28%). Doses were delayed in up to 38% of these patients.

Among the HD patients, 90.9% of those receiving the alternating



Dr Ruth Pettengell, "These lymphoma data represent important and quite dramatic RDI reductions".

ChIVPP/PABLOE + ChIVPP/EVA regimen had neutropenic events compared with 67.9% of those on ABVD and 37.5% of those on the Stanford V regimen. This delayed doses in up to 64.3% of patients.

Neutropenic events

Neutropenic events had a significant impact on the ability to deliver the planned dose intensity. Twenty-nine per cent of patients overall received $< 85\%$ RDI; 15% of patients receiving ABVD, 11% of those on CHOP, and 15% of those receiving 14-day regimens for NHL received $\leq 70\%$ RDI (Figure 2). These represent 'important, RDI reductions', she said.

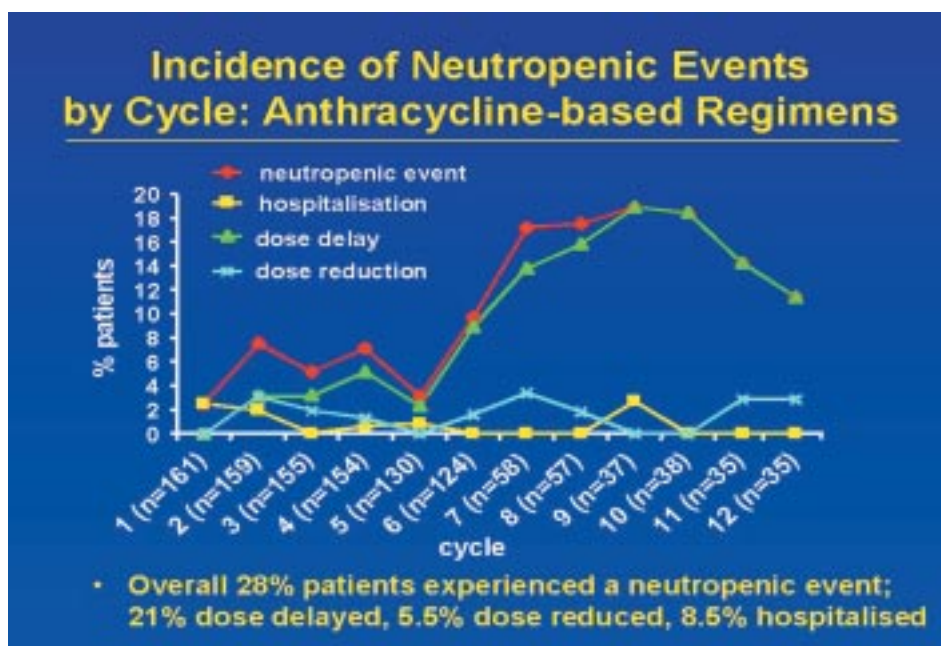


Figure 2

The audit was conducted in patients treated several years ago, when use of G-CSF was unusual, and only 1.7% of those admitted to hospital were treated with it. 'Probably this is inappropriate use as, at the time, they were already neutropenic,' Dr Pettengell observed.

The few patients who had had a neutropenic event received a significantly higher RDI if they were given G-CSF than if they were not.

The audit revealed that a first neutropenic event significantly increased the risk of a second one (Table 1). 'So we can identify reasonably easily our at-risk group and adopt a policy of secondary prophylaxis or pre-emptive treatment and possibly prevent a lot of this dose reduction/delay and perhaps even hospitalisation.' This, she said, was 'probably the most important point' from the audit.

She explained that this retrospective dataset, and particularly the numbers of patients treated with G-CSF, were too small to determine whether there was an association between RDI and outcome. An ongoing prospective randomised trial

in approximately 880 patients treated with either PMitCEBO or CHOP with or without G-CSF, and due to close within a few months, will address this question.

Risk of subsequent neutropenic events after a first event	
	Neutropenic event after a first event (% patients)
CHOP + MCOP (1 st line)	31.6
PMitCEBO + PACEBO + PACEBOM	38.5
ABVD	69.2
ChIVPP/PABLOE	37.5

Table 1

Overview of Growth Factor Support in Europe

AS PROPHYLAXIS

■ Lymphoma

- **In the UK**
 - Many relapse regimens incorporate G-CSF as primary prophylaxis
 - Increasing use of G-CSF as secondary prophylaxis because it saves hospital admission costs
- **In Belgium**
 - Primary prophylaxis with more intensive chemotherapy regimens
- In general, there is a need for more prospective data in NHL, including economic evaluation, on primary versus secondary prophylaxis

■ Breast cancer

- **In the UK**
 - Primary prophylaxis not established
 - Secondary prophylaxis if frequent dose delays and neutropenic sepsis
- **In Germany**
 - Primary prophylaxis not routinely used outside the setting of a clinical trial
 - Secondary prophylaxis becoming more common
- **In Spain**
 - Primary prophylaxis reserved for intensive regimens and/or at-risk patients
 - Secondary prophylaxis the rule with standard protocols

AS THERAPY FOR NEUTROPENIC COMPLICATIONS (ie: commenced after event has already occurred)

- In the UK and Germany, not routinely used
- In Belgium, only if life-threatening

European Trends in Neutropenia Management

- Most oncologists aware of ASCO guidelines for colony stimulating factors (CSFs)
- More doctors use G-CSF appropriately although inappropriate use is still prevalent
- Primary prophylaxis most common in France and used least in Italy and the UK
- Use of primary prophylaxis seldom based on neutropenia risk assessment
- Need for tool to predict risk of neutropenia in individual patients
- Need for prospective study to identify at-risk patients

In addition to the ASCO guidelines, several other organisations have published recommendations for the use of growth factor support, including:

- ESMO
- EORTC

In Europe:

- ASCO guidelines are the best known.
- More oncologists than previously are now using G-CSF appropriately.
- Growth factors continue to be used inappropriately.

European survey

This information comes from a survey initiated by Amgen Europe in 2001. The

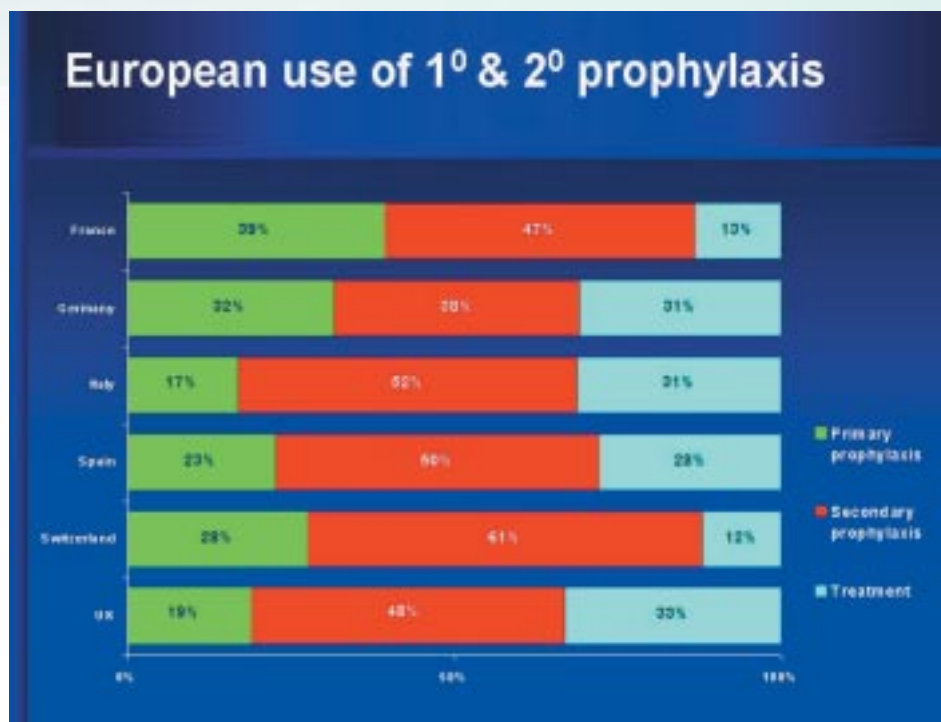


Figure 3

investigators (GfK Healthcare) contacted: 106 oncologists and 105 haematologists in France, Germany, Italy, Spain, Switzerland and the UK.

The majority claimed to follow the ASCO guidelines. Primary G-CSF prophylaxis was used most frequently in France, perhaps due to the prevalence of protocol-driven prescribing, and least often in Italy and the UK. Conversely, G-CSF treatment for neutropenic complications was least common in France and Switzerland and much more so in Spain, Italy, Germany and the UK (Figure 3)*.

The survey also showed that, overall, in the past few years there has been a trend towards using G-CSF to prevent, rather than treat, neutropenic complications, and that physicians now are as likely to use primary as secondary prophylaxis. Indeed 19% of oncologists and 34% of haematologists report the use of primary

prophylaxis although the decision to use it depends more on the type of chemotherapy, the ANC and the patient's general condition, than on an estimate of their risk of neutropenia. In fact, a third of respondents could not quantify a neutropenia risk threshold while several others were unable to give qualified feedback.

Need for risk assessment tool

These findings highlight the need for an easy-to-use, evidence-based, point-of-care assessment tool that is acceptable to oncologists and haematologists, which they could use to predict the risk of neutropenia in an individual patient, and which would be applicable to different cancer types. Many of the physicians expressed support for such a tool, which is the specific goal of both the US-ANC and INC-EU.

* Data generated by GfK Healthcare, Nürnberg, Germany

The US Experience

- Practice audits have produced important findings
- NHL audit revealed factors predicting risk of febrile neutropenia

Despite the US-ANC's brief history to date - it was formed only about 18 months ago - it already has made important progress towards its goal and, said Prof Lyman, its members have accumulated knowledge and expertise that could be useful to the European group.

Risk factors

Prof Lyman explained that a systematic review of published clinical trials had been unsatisfactory owing to inconsistent reporting of objective data on relative dose intensity. Practice audits have been more rewarding and have produced several important findings. For example, in both NHL patients receiving a standard CHOP regimen and in those with early breast cancer treated with a variety of different agents, the greatest risk of febrile neutropenia is during the first cycle of chemotherapy - 'a fairly compelling argument', at least for NHL, in primary prophylaxis.

The NHL audit also revealed several important independent factors predicting patients at risk of febrile neutropenia:

- Age (> 65 vs. < 65 years)
- Baseline haemoglobin (<12 vs. >12g/dl)
- Heart disease
- Renal disease
- Planned dose intensity (< 80% vs. >80%)
- No G-CSF primary prophylaxis

The cumulative risk of febrile neutropenia was 59% for those with a combined score of > 3 of these factors vs. 41% for those with a score of ≤ 3

($p < 0.0001$). The analysis also showed that the occurrence of febrile neutropenia in the first cycle was highly and significantly predictive of a subsequent neutropenic event.

Economics of growth factor support

The US-ANC has examined the economics of prescribing growth factors in patients receiving chemotherapy, considering indirect as well as direct costs of treatment. Results suggest that, for high-risk patients, the threshold at which G-CSF primary prophylaxis starts to save money is when the incidence of febrile neutropenia in a control group is not $\geq 40\%$, as suggested in the ASCO guidelines, but is < 20% - and is closer to 10% when the patients' and families' out-of-pocket expenses are also considered.

Developing risk models

There is already substantial evidence, including that from a study by Silber *et al.* in women receiving adjuvant therapy for breast cancer*, that first-cycle ANC is a significant predictor of future neutropenic events. The US-ANC felt, however, that it was possible to develop even more reliable, risk models for bedside use, and developed a risk model based on four parameters:

- Age > 65 years
- First cycle ANC < 500
- First cycle febrile neutropenia
- First cycle decrease in haemoglobin of >1 g/dl



Prof Gary Lyman, Director
ANC Co-ordinating Centre

Cumulative risk of febrile neutropenia was significantly greater ($p < 0.0001$) for patients with a risk score of ≥ 2 compared with < 2. Although the risk of febrile neutropenia is not very high in patients with early breast cancer, 'in principle we can sort patients increasingly effectively with consideration of multiple parameters,' said Prof Lyman. This scoring system similarly identifies those at risk of future episodes of febrile neutropenia, dose reduction or dose delay. 'If a patient had none of these risk factors, there was only about a 15% risk of a future neutropenic event; whereas if they had one or more, the risk climbed progressively to over 40% estimated over the entire course of therapy.'

Spin-offs from the group's research include many publications and meeting presentations, as well as an interactive CD-ROM that physicians can use to determine risk thresholds for individual patients.

Despite these achievements, the US-ANC recognises that existing data - whether from clinical trials or retrospective audit - carry considerable limitations, and have therefore started their own prospective registry.

Prof Lyman concluded, 'It's been a great adventure for us, and we feel we're just reaching our stride.'

* Silber JH *et al.* J Clin Oncol 1998; 16: 2392-2400

European Experience in Breast Cancer ...continued

Overall, 301 patients had no neutropenic events and received a mean RDI of 97%; nearly 80% received > 85% RDI.

The 121 (28.7%) patients with neutropenic events received a mean RDI of 88% with fewer than half receiving >85% RDI.

These differences between the neutropenic and non-neutropenic groups were statistically significant ($p < 0.01$ for both CMF and anthracycline regimens).

Treatment response to neutropenia

Dose delay was the most common response to neutropenia, the risk of which increased with the number of cycles (Figure 1). For both the CMF and anthracycline regimens, the mean cycle delay due to neutropenia was 7.5 days, and the mean dose reductions were 31% and 22.5%, respectively.

Of the patients with neutropenia, only 6% overall (2% of those admitted to hospital and 4% of those treated as outpatients) received G-CSF, for an average duration of approximately one to five days. Although numbers are small, and the data uncontrolled, in the patients given G-CSF 'there is a strong suggestion of a dose intensity, which is similar to those patients who didn't have neutropenia'.

Again, as has emerged from the other audits, one neutropenic event strongly predicted a second: of patients experiencing one such event, 56% of those receiving CMF and 72% of those on anthracycline regimens had a second event. 'And, again, there's a trend to G-CSF reducing that risk,' Prof Leonard added. Fewer patients given G-CSF experienced a second episode: 25% vs. 37% of those who did not receive growth factor.

These findings support the ASCO guidelines, which recommend the use of G-CSF secondary prophylaxis in patients

in whom dose maintenance is important but is threatened by neutropenia.

Prof Leonard then described some prospective trials to further investigate the use of G-CSF in the adjuvant therapy of breast cancer:

- Already underway, the SPROG (Secondary Prophylaxis Of G-CSF) trial in about 800 patients in which those who experience a neutropenic episode will be randomised either to the standard treatment at that particular hospital or to routine prophylaxis with G-CSF.
- In planning, the ACCENT (Adjuvant Combination Chemotherapy in the Elderly versus No Treatment) study in which elderly patients will be randomised to one of three arms: no treatment, single-agent capecitabine or FEC polychemotherapy.

INC-EU next meeting at San Antonio

The INC-EU Study Group will next be meeting at

The San Antonio Breast Cancer Symposium in Texas, 11 - 14 December 2002.

A number of INC-EU events are planned including a presentation at the 6th International Symposium on Febrile Neutropenia to be held between 17 - 19 December 2003 in Brussels, Belgium.



Advancing Neutropenia Management

The evidence discussed at the launch of the INC-EU Study Group showed:

- Chemotherapy-associated neutropenic complications are widespread in Europe
- There is a wide variation in the use of G-CSF support, including sub optimal use
- The use of G-CSF as primary prophylaxis for neutropenic events for all chemotherapy regimens may not be cost-efficient, although early data from the US suggest more patients might benefit than is suggested in the ASCO guidelines
- There is a growing trend for secondary prophylaxis in patients selected according to their risk of neutropenia although this may be superseded by pre-emptive use among selected patients

Prospective studies

While individual studies provide some insights into the factors influencing the risks of febrile neutropenia, as yet there are insufficient data to develop a definitive risk assessment model. The combination of several larger datasets, together with prospective studies will, it is believed, provide a more compelling argument for neutropenia risk assessment.

European systematic review

The INC-EU Study Group has agreed to run a systematic review of existing European datasets. The results from this systematic review will help define a prospective study with a uniform protocol. This will facilitate the pooling of prospective data from across Europe, ultimately leading to the development of a risk model and a more evidence based approach to G-CSF prophylaxis for adjuvant chemotherapy.

For further information about the INC-EU contact:

The INC-EU Co-ordinating centre

Ideas in Practice, Wildmoor House, Wildmoor, Sherfield on Loddon Hook, Hants, RG27 0HD, UK
t: +44 1256 884000 f: +44 1256 880883 e: info@inceu.org

Supported by an educational grant from Amgen Europe

Published by: Ideas in Practice,
Technical Author: Liz McNeil Grist
ISSN 1479-2290