

# Long term prognosis and quality of life following intensive care for life-threatening complications of haematological malignancy

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**Summary** Ninety-two consecutive adult patients admitted with acute life-threatening complications of haematological malignancy were studied to determine long term outcome. The quality of life was evaluated in seven long term survivors who are currently alive more than 1 year after hospital discharge using three validated methods: the Nottingham Health Profile, the Hospital Anxiety and Depression Scale and the Perceived Quality of Life Scale. Patients were also asked whether they had returned to work, whether their daily activities were limited and whether they would be willing to undergo intensive care again under the same circumstances. The in-hospital mortality rate was 77%. Median duration of long term survival was 23 months (range 6 weeks to 8 years). Long term survival did not appear to be related to either the aetiology or the severity of the acute illness, but seemed to be determined solely by the nature and progress of the underlying malignancy. The quality of life of six of the seven long term survivors is good, while that of the other is acceptable. None of the patients reported any increased limitation of their daily activities, five had returned to full time employment and all seven stated that they would be willing to undergo intensive care again under the same circumstances.

Although hospital mortality rates are very high when patients with haematological malignancy develop an acute life-threatening illness, it is now clear that for a small but significant proportion of these patients intensive care is life-saving (Anger *et al.*, 1987; Brunet *et al.*, 1990; Estopa *et al.*, 1984; Hauser *et al.*, 1982; Johnson *et al.*, 1986; Lloyd-Thomas *et al.*, 1988; Peters *et al.*, 1988; Schuster & Marion, 1983; Snow *et al.*, 1979). When assessing the value of intensive care it is, however, essential to consider not only immediate mortality rates but also both the long term prognosis and quality of life of those who do survive to leave hospital. A number of studies have assessed in unit and hospital mortality rates for patients with acute medical complications of haematological malignancy, and some have identified factors associated with a poor short term outcome (Johnson *et al.*, 1986; Lloyd-Thomas *et al.*, 1988; Schuster & Marion, 1983), but there is only limited information on the long term prognosis of those who do survive to leave hospital (Brunet *et al.*, 1990; Peters *et al.*, 1988) and the quality of life of long term survivors has not previously been assessed.

The objective of this study was to evaluate long term outcome and quality of life in patients discharged from hospital following intensive care for life-threatening medical complications of haematological malignancy. We also sought to identify factors which might influence long term prognosis in such cases.

## Methods

The records of all adults admitted to the intensive care unit at this hospital with life-threatening medical complications of haematological malignancy during the 10 year period January 1980 to December 1989 were reviewed retrospectively.

The severity of the acute illness was assessed by the APACHE II score calculated from the most abnormal variables recorded during the first 24 h of admission (Knaus *et al.*, 1985).

The nature of the acute illness, the underlying malignancy and the number of failed organs were also noted for each patient.

Patients were categorised as non-survivors (death in the intensive care unit or after discharge to the general ward) and

survivors (discharge from hospital). The mortality in hospital and survival times for those who were discharged from hospital were determined.

The quality of life of those patients currently alive more than 1 year after discharge from hospital (seven patients) was evaluated using three validated measures: the Nottingham Health Profile, the Hospital Anxiety and Depression Scale and the Perceived Quality of Life Scale, each of which assesses different aspects of quality of life (Hunt *et al.*, 1986; Patrick *et al.*, 1988; Zigmond & Snaith, 1983). The questionnaires were mailed to the seven patients after they had been contacted by telephone.

### *The Nottingham Health Profile (NHP)*

The NHP (Hunt *et al.*, 1986) is a two-part self administered questionnaire designed to measure perceived health problems and the extent to which such problems affect normal activities. Part I contains 38 statements covering feelings and functions in six areas: pain, energy, physical mobility, sleep, social isolation and emotional reactions. The answers to these statements are scored on a scale of 0–100 for each category. Lower scores indicate fewer difficulties. Part II contains seven yes/no questions examining the impact of health problems on occupation, ability to perform domestic tasks, personal relationships, sex life, social life, hobbies and holidays.

### *The Hospital Anxiety and Depression Scale (HAD)*

The HAD (Zigmond & Snaith, 1983) is a brief but reliable technique for detecting states of anxiety and depression, it consists of two sets of seven questions with four point response scales. Each answer is scored on a scale of 0 to 3, the sum of the individual scores give an overall depression and anxiety score. Scores of greater than ten indicate significant anxiety or depression; scores of less than eight are not significant; and scores of 8–10 are of borderline significance.

### *The Perceived Quality of Life Scale (PQOL)*

The PQOL (Patrick *et al.*, 1988) assesses the patients own perception of their quality of life based on their satisfaction, on a scale of 0 to 100, with 11 items, describing fundamental needs of daily living (Table I). Higher scores indicate greater satisfaction.

The patients were also asked a number of other pertinent questions: whether they had returned to work, whether there

was any increased limitation in their daily activities and would they be willing to undergo intensive care again under the same circumstances.

#### Statistical methods

The relationship between the APACHE II score of the long term survivors and the duration of survival was assessed by regression analysis.

**Table I** Perceived quality of life scale

'How Satisfied are you on a Scale from 0-100 with ....?'
1. The health of your body (HEALTH)
2. Your ability to think and remember (THINKING)
3. How happy are you (HAPPINESS)
4. How much you see your family and friends (FAMILY)
5. The help you get from family and friends (HELP)
6. Your contribution to the community (COMMUNITY)
7. Your activities outside work (LEISURE)
8. How your income meets your needs (INCOME)
9. How respected you are by others (RESPECT)
10. The meaning and purpose of your life (MEANING)
11. With working/not working/retirement (WORK)

## Results

### Patient population and survival

Ninety-two patients (58 male, 34 female) were admitted during the 10 years (Table II). Seventy-one patients (77%) died in hospital, of whom 60 died in the intensive care unit and 11 died shortly after discharge to the general ward.

Twenty-one patients (23%) were discharged from hospital alive. Their median duration of survival was 23 months (range 6 weeks to 8 years). Eighteen patients (86%) were still alive after 6 months, 13 patients (62%) after 1 year, and nine patients (43%) after 3 years. Eight of the 21 survivors are currently still alive at 8, 7, 7, 5, 4, 3, 3 years and 4 months after leaving hospital (Table III). Of these hospital survivors, 18 (68%) were admitted with acute respiratory failure, complicated in two by septic shock. Their median APACHE II score was 21 (range 12-26), and the median number of failed organs was two (range 1-3).

There was no relationship between the severity of the acute illness as assessed by the APACHE II score and the duration of long term survival ( $r = 0.1$ ). The number of failed organs was not a good predictor of long term prognosis as three of the four longest survivors had failure of three organs during their acute illness. Neither did the aetiology of the acute illness appear to influence long term survival. Although two of the five patients alive 4 years or more after discharge were admitted with relatively simple acute problems (post-opera-

**Table II** Patient population and survival

Disease	No. of patients	APACHE II score		ICU deaths	Ward deaths	Survivors
		Median	Range			
Acute myeloid leukaemia	33	28	14-48	21	4	8
Acute lymphatic leukaemia	23	25	14-36	13	2	8
Chronic myeloid leukaemia	4	23	18-30	2	1	1
Chronic lymphatic leukaemia	1	28		0	1	0
Multiple myeloma	3	24	21-37	3	0	0
Hodgkin's lymphoma	7	24	18-35	5	1	1
Non-Hodgkin's lymphoma	21	25	12-44	16	2	3
Totals	92			60	11	21

**Table III** Details of the 21 hospital survivors

Patient	Diagnosis	Age	Sex	Acute illness	APACHE II score	Organ failure	Duration of survival
1.	ALL	46	M	P, RF, ARF	23	2	6 weeks
2.	ALL	16	M	P, RF	18	1	4 months <sup>a</sup>
3.	ALL	22	M	URTO	24	1	5 months
4.	ALL	45	M	P, RF	18	1	6 months
5.	ALL	46	M	P, RF	20	1	7 months
6.	ALL	38	F	P, RF	16	2	1 yr 2 mths
7.	ALL	20	F	P, RF	24	2	3 yrs 8 mths
8. <sup>b</sup>	ALL	21	F	P, RF, S, C	22	3	7 years <sup>a</sup>
9.	AML	24	F	P, RF	21	1	3 months
10.	AML	59	F	URTO	14	1	7 months
11.	AML	21	M	P, RF, S	19	3	8 months
12.	AML	38	M	P, RF	21	2	1 yr 11 mths
13.	AML	53	M	P, RF, SS	25	3	2 yrs 3 mths
14. <sup>b</sup>	AML	46	M	P, RF	17	1	3 yrs 2 mths <sup>a</sup>
15. <sup>b</sup>	AML	21	F	P, RF	22	1	3 yrs 6 mths <sup>a</sup>
16. <sup>b</sup>	AML	30	M	P, RF, SS	25	3	8 years <sup>a</sup>
17. <sup>b</sup>	CML	65	M	H	24	1	5 years <sup>a</sup>
18.	NHL	58	F	Post-op RF	17	1	6 months
19.	NHL	36	F	P, RF	12	3	3 yrs 10 mths
20. <sup>b</sup>	NHL	35	F	Post-op RF	12	3	7 years <sup>a</sup>
21. <sup>b</sup>	HL	19	F	S, RF	26	3	4 years <sup>a</sup>

<sup>a</sup>Patients who are still alive; <sup>b</sup>patients undergoing quality of life evaluation. Abbreviations: P = pneumonia, RF = respiratory failure, ARF = acute renal failure, H = haemorrhage, URTO = upper respiratory tract obstruction, S = septicaemia, SS = septic shock, C = convulsion.



## Discussion

Intensive care clinicians are frequently faced with ethical dilemmas concerning the appropriate extent of medical intervention for critically ill patients whose prognosis is poor (Thibault *et al.*, 1980; Wanzer *et al.*, 1984). Not only can intensive care be mentally and physically distressing for patients, relatives and staff but it is also expensive, especially for non-survivors (Cullen *et al.*, 1976; Detsky *et al.*, 1981; Turnbull *et al.*, 1979). Both for a humane approach to the management of critically ill patients and to ensure that limited resources are used appropriately, it is therefore important to avoid admitting patients who cannot benefit from intensive care and to limit further aggressive therapy when the prognosis is clearly hopeless.

Hospital mortality rates have been reported to be particularly high (69–80%) when patients with haematological malignancy develop an acute illness of sufficient severity to warrant intensive care admission, especially when they present with respiratory failure (80–96%) (Anger *et al.*, 1987; Estopa *et al.*, 1984; Hauser *et al.*, 1982; Johnson *et al.*, 1986; Lloyd-Thomas *et al.*, 1988; Schuster & Marion, 1983; Snow *et al.*, 1979). In this series of 92 adults admitted to our intensive care unit with life threatening medical complications of haematological malignancy, the in-hospital mortality rate was 77%; broadly similar to that reported by others.

When evaluating the results of intensive care it is important to consider not only immediate mortality rates but also the duration of survival and quality of life of those who leave hospital. Peters *et al.* (1988) found that of 116 patients with haematological malignancy who required intensive care and mechanical ventilation only 18% survived to be discharged from hospital; their median duration of survival was 12 months with a range of 1 month to 7 years. In our 21 survivors the median duration of survival was longer at 23 months (range 6 weeks to 8 years), with eight patients currently alive. The long term survival rate was 86% at 6 months and 62% at 1 year; higher than that reported by Brunet *et al.* (1990) (64% after 6 months and 44% after 1 year). The duration of long term survival did not appear to be related to either the aetiology of the acute illness precipitating intensive care admission, or to the severity of the acute condition as assessed by the APACHE II score and number of failed organs. Indeed three of our four longest survivors received mechanical ventilation, had APACHE II scores of 24–26 and failure of three organs. Uncontrolled malignancy was responsible for all the deaths in those patients who were discharged from hospital, even though patients were not admitted to intensive care if such progression was thought to be likely at the onset of their acute illness. Similarly, Crawford *et al.* (1988) found that, although the prognosis was grave, some of his patients who developed complications after marrow transplantation with failure of three to four organs and who required mechanical ventilation

became long term survivors. Review of the clinical records of these patients revealed no distinguishing characteristics in terms of the duration or mode of ventilation, types of complication, or rapidity of recovery. The duration of long term survival therefore appears to be determined solely by the nature and progress of the underlying malignancy, and not by the severity of the acute illness.

In this series, six of the seven patients currently alive more than 1 year after discharge from hospital have a good quality of life, broadly similar to that of the same age and sex norms in the general population, while that of the other is acceptable. None of the patients reported any increased physical limitations to their daily activities following intensive care. The majority returned to full-time employment with no problems at work. Generally, they reported a moderate to high level of satisfaction with most aspects of their daily lives as shown by the PQOL assessment. They all expressed great satisfaction regarding their family life and the help and support that they received from their family and friends. Only one patient could be considered to be suffering from anxiety and none was depressed. Most encouragingly, all seven patients stated that under similar circumstances they would be willing to undergo the same intensive care treatment again. It must be recognised, however, that the quality of life of at least some of those who died from uncontrolled malignancy following hospital discharge, whom we have not assessed, may have been poor.

The hospital mortality of critically ill patients with haematological malignancy is undoubtedly high and the long term prognosis for many is poor. Nevertheless, this study has demonstrated that for a significant number intensive care is life-saving, long term survival is possible, a number must be presumed cured and their quality of life is good. Previous studies have identified various factors associated with a poor short term outcome (Johnson *et al.*, 1986; Lloyd-Thomas *et al.*, 1988; Schuster & Marion, 1983) and these can be used as guidelines when assessing the immediate prognosis of individual patients. Neither ourselves nor others (Crawford *et al.*, 1988), however, have been able to distinguish any features of the acute illness which influence the likelihood of long term survival; this seems to depend solely on the progress of the underlying malignancy, something which is often difficult to predict before or during intensive care. Despite the high mortality rate, intensive care is therefore justified for patients with acute life-threatening complications of haematological malignancy, unless or until it is clear that there is no prospect of recovery from the acute illness, or that the underlying malignancy cannot be controlled.

Dr E. Yau was in receipt of an Aylwen Bursary through the Special Trustees of St Bartholomew's Hospital.

We would like to thank Ms K. Rowan, UK Apache II study co-ordinator, for helpful advice.

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