

HODGKIN LYMPHOMA

Table 20.1: Characteristics of the cohort

	Males	Females
First primary cancer	1,261	1,009
Age at diagnosis		
Mean	38.2	38.9
<65 years	1,101	847
=>65 years	160	162
Total person-years	10,341	8,344
Mean follow-up (years)	8.2	8.3
Histological confirmation (%)	98.9	99.0
Nodular sclerosis	50.9	64.1
Mixed cellularity	19.9	14.7
Lymphocyte rich	9.0	4.9
Nodular lymphocyte predominance	4.2	2.0
Lymphocyte depletion	3.0	2.3
Unspecified	13.0	12.0
Second primary cancers		
Non-simultaneous	88	68
Simultaneous	7	2

Table 20.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	0.6	3.4	6.2	10.0	13.2	13.2
All cancers	F	0.6	3.2	4.9	8.4	13.3	15.4
Colon	M	0.1	0.6	0.6	0.8	1.3	1.3
Colon	F	0.0	0.3	0.3	0.6	0.6	0.6
Lung	M	0.2	0.5	0.7	1.0	1.4	1.4
Lung	F	0.0	0.3	0.5	0.5	0.5	0.5
Breast	F	0.0	0.2	0.4	1.4	4.0	6.1
NHL	M	0.1	0.6	1.8	2.6	3.9	3.9
NHL	F	0.3	1.0	1.4	1.4	2.2	2.2

All other cancers have 10-year cumulative risk of < 0.5% for both sexes.

Common second cancers

From Table 20.2 a man's 10-year cumulative risk of contracting a second cancer following Hodgkin lymphoma is seen to be higher than that for a woman (1 in 16 compared with 1 in 20), and a male excess is seen for each of the three cancer types to which both sexes are susceptible, colon, lung and NHL.

Age-specific Incidence

The principal feature of Figure 20.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages and converge with increasing age.

Trends in the SIRs

The trends in Figure 20.2 show increased SIRs following a diagnosis of Hodgkin lymphoma and that these fluctuate over years of follow-up with the highest SIRs between 2-4 years and more than eight years following initial diagnosis.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 20.4 (page 98) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The significant overall 23-year SIRs are 1.86 for men and 2.18 for women. The statistically significant SIRs for men are NHL 10.29, AML 20.01, other 2.79 and ill-defined 4.69 and for

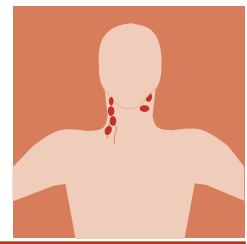


Figure 20.1: Age-specific rates

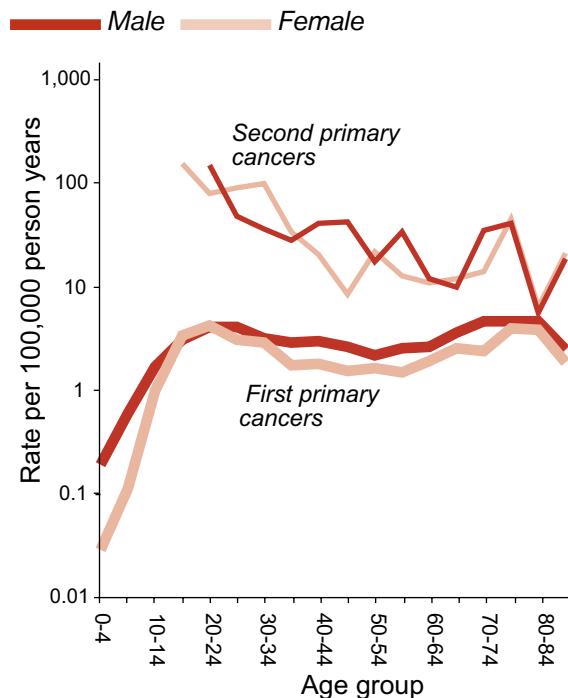
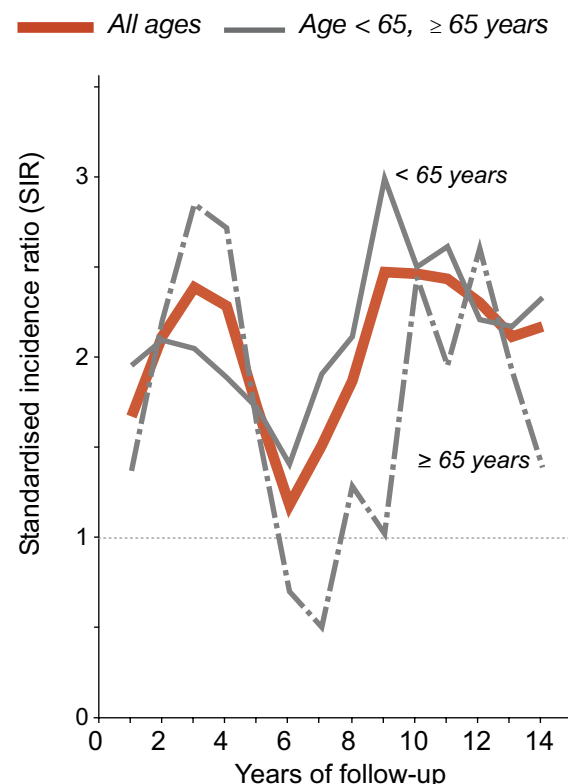


Figure 20.2: Trends in the annual SIR for all second primary cancers



women are NHL 11.58 and other 4.45.

Trends in SIRs with age

In Figure 20.2 the general pattern of trends in SIRs are similar for both age groups, with the under 65 year age group having consistently higher SIRs than older people after five years.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 20.5 (page 99). The younger age group has 20-40% higher SIR than the older age group. The SIRs are 1.97 for men first diagnosed before 65 years of age compared with 1.68 for those diagnosed at an older age. The SIRs for women are 2.42 and 1.74 respectively. All the above SIRs are significantly greater than 1.0.

For the under 65 year age group the significant SIRs for men are AML 31.97, NHL 12.12, thyroid 8.52 and ill-defined 7.57.

For women under age 65 the significant SIRs are gallbladder 17.42, NHL 9.54, rectum 5.43, colorectum 2.79 and breast cancer 1.95.

Comments

The risk of a second cancer following Hodgkin lymphoma is lower than for most cancers because of the young mean age at diagnosis.

Several studies have reported increased risk of leukaemia following treatment with alkylating chemotherapy for Hodgkin lymphoma. Radiotherapy for Hodgkin lymphoma does not appear to increase the risk for leukaemia. Non-significant increases in the risk for lung cancer are probably due to radiotherapy.

The excess risk for non-Hodgkin lymphoma could be due to misclassification of the two diseases or to common defective immune

NON-HODGKIN LYMPHOMA

Table 21.1: Characteristics of the cohort

	Males	Females
First primary cancer	7,166	6,071
Age at diagnosis		
Mean	59.9	63.6
<65 years	3,970	2,834
=>65 years	3,196	3,237
Total person-years	34,741	30,287
Mean follow-up (years)	4.8	5.0
Histological confirmation (%)	98.8	98.7
Mature B-cell	73.9	74.5
Diffuse or unspecified	20.0	20.4
Mature T- and NK-cell	5.3	4.7
Precursor cell lymphoblastic	1.0	0.5
Second primary cancers		
Non-simultaneous	645	402
Simultaneous	53	37

Table 21.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.3	5.7	9.8	12.8	15.6	16.4
All cancers	F	0.9	4.1	7.4	9.8	11.8	11.8
Colon	M	0.1	0.4	0.7	1.2	1.8	2.1
Colon	F	0.2	0.6	0.8	1.2	1.5	1.5
Lung	M	0.2	0.8	1.2	1.6	1.6	1.6
Lung	F	0.1	0.3	0.6	0.8	1.5	1.5
Melanoma	M	0.1	0.4	0.8	0.9	0.9	1.3
Melanoma	F	0.1	0.2	0.7	0.8	0.8	0.8
Prostate	M	0.3	1.1	2.0	2.7	3.5	3.5
NHL	M	0.1	0.4	0.7	1.0	1.8	1.8
NHL	F	0.1	0.6	1.1	1.4	1.4	1.4

All other cancers have 10-year cumulative risk of less than 0.5 % for both sexes.

mechanisms.

Common second cancers

From Table 21.2 a man's 10-year cumulative risk of contracting a second cancer following NHL is seen to be higher than that for a woman (1 in 10 compared with 1 in 14) with common second primary cancer sites being colon, lung, melanoma and NHL for both men and women and prostate cancer for males.

Age-specific Incidence

The principal feature of Figure 21.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages and the curves begin to converge with increasing age.

Trends in the SIRs

The trends in Figure 21.2 show increased SIRs following a diagnosis of NHL and small increases in these risks with years of follow-up.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 21.4 (page 100) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 1.22 for both men and women (both significantly greater than 1). Statistically significant SIRs for men are Hodgkin lymphoma 7.89, ALL 6.24, AML 5.30, thyroid 3.54, NHL 2.79, other 2.64, kidney 1.85 and ill-defined 1.55. For women, statistically significant SIRs were NHL 4.03, AML 5.21 and

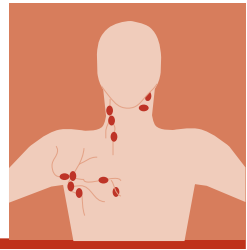


Figure 21.1: Age-specific rates

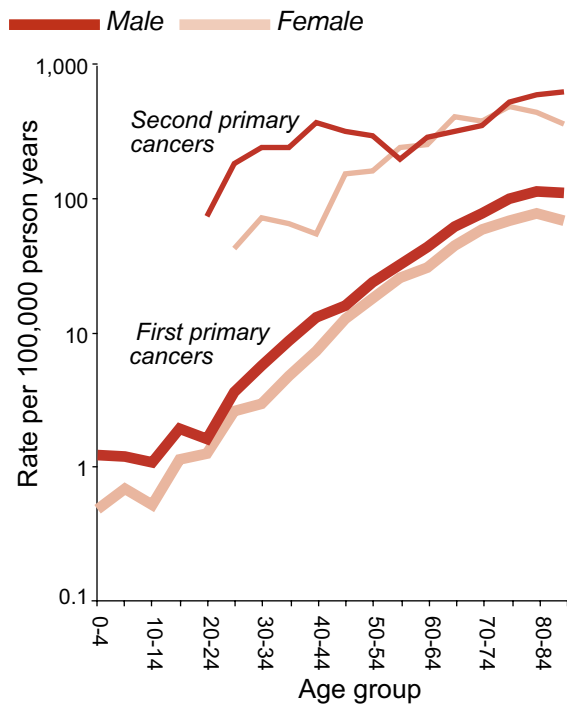
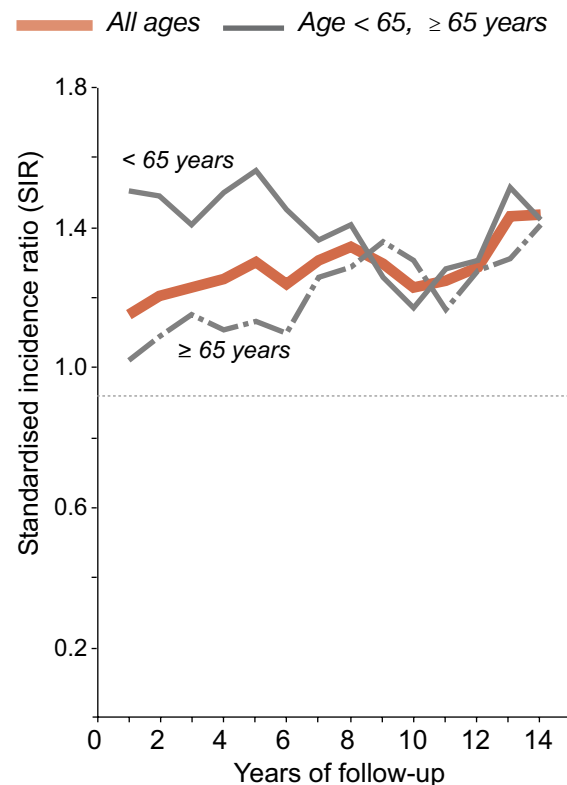


Figure 21.2: Trends in the annual SIR for all second primary cancers



other 2.18.

Trends in SIRs with age

In Figure 21.2 increasing SIRs with increasing follow-up is observed for persons aged over 65 years. Those in the younger age group had higher SIRs that decreased over the first 10 years after which they converged with SIRs for the older age group.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 21.5 (page 101). The younger age group has SIRs 20-40% higher than the older age group. The SIRs are 1.50 for men first diagnosed before 65 years of age compared with 1.05 for those diagnosed at an older age. The SIRs for women are 1.34 and 1.14 respectively. All the above SIRs are significantly greater than 1 except for men aged over 65 years.

For the under 65 year age group the highest SIRs for men are AML 10.20, Hodgkin lymphoma 7.62, NHL 4.19, other 3.30, ill-defined 3.12 and melanoma 1.72.

For women under age 65 the highest SIRs are ALL 12.94, AML 8.90, NHL 6.00 and other 3.54 with significantly lower risk of breast cancer 0.65.

Comments

Radiotherapy and chemotherapy with alkylating agents for non-Hodgkin lymphoma are known to increase the risk of leukaemia.

The excess risk for Hodgkin lymphoma could be due to misclassification of the two diseases or

MULTIPLE MYELOMA

Table 22.1: Characteristics of the cohort

	Males	Females
First primary cancer	2,045	1,727
Age at diagnosis		
Mean	67.2	69.3
<65 years	809	582
=>65 years	1,236	1,145
Total person-years	6,293	5,536
Mean follow-up (years)	3.1	3.2
Histological confirmation (%)	97.6	97.2
Second primary cancers		
Non-simultaneous	117	87
Simultaneous	13	12

Table 22.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.2	4.6	6.7	7.5	7.8	7.8
All cancers	F	1.4	4.2	5.2	6.3	6.7	6.7
Colon	M	0.1	0.5	0.8	0.9	0.9	0.9
Colon	F	0.2	0.6	0.8	0.8	0.8	0.8
Lung	M	0.0	0.6	1.1	1.1	1.1	1.1
Lung	F	0.1	0.5	0.7	0.7	0.7	0.7
Melanoma	M	0.1	0.4	0.6	0.6	0.6	0.6
Melanoma	F	0.2	0.3	0.5	0.7	0.7	0.7
Prostate	M	0.4	1.1	1.4	1.6	1.6	1.6

All other cancers have 10-year cumulative risk of < 0.5% for both sexes.

to common defective immune mechanisms.

Common second cancers

From Table 22.2 a man's 10-year cumulative risk of contracting a second cancer following multiple myeloma is seen to be higher than that for a woman (1 in 15 compared with 1 in 19) with common second primary cancers being colon, lung, melanoma and prostate.

Age-specific Incidence

The principal feature of Figure 22.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher and the curves run parallel with increasing age.

Trends in the SIRs

The trends in Figure 22.2 show no increased SIRs until 12 years after initial diagnosis of multiple myeloma.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 22.4 (page 102) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 0.93 for men and 1.21 for women but neither are significantly greater than 1.0. For men, no individual cancer sites have statistically significant SIRs, and only

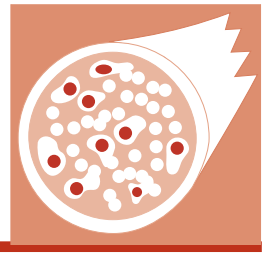
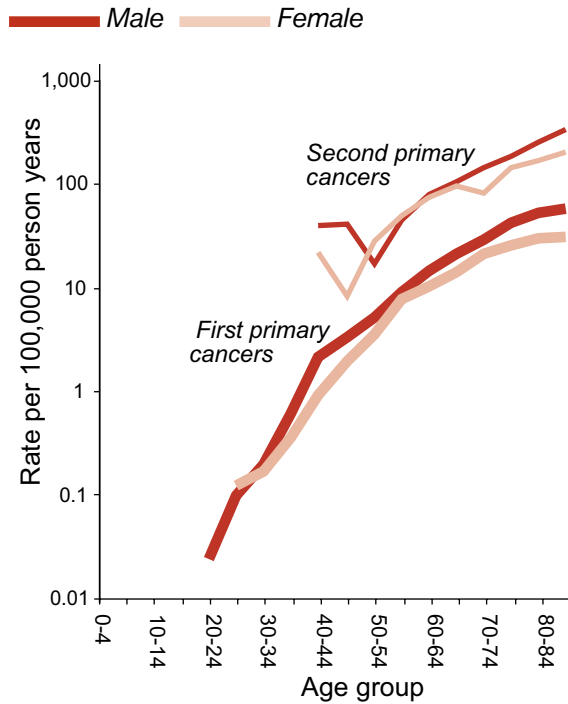


Figure 22.1: Age-specific rates



AML was increased 7.13 for women.

Trends in SIRs with age

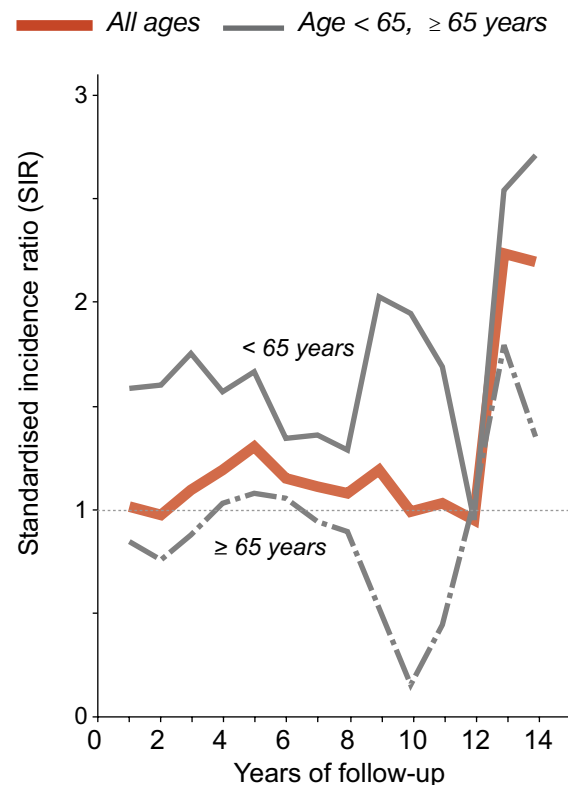
In Figure 22.2 SIRs for the under 65 year age group have consistently higher SIRs than older people until about 12 years after initial diagnosis.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 22.5 (page 103). The younger age group has about twice the risk of the older age group. The SIRs are 1.52 for men first diagnosed before 65 years of age compared with 0.72 for those diagnosed at an older age. The SIRs for women are 1.69 and 1.03 respectively. The SIRs in the younger age group were significantly greater than 1 for both sexes.

For men aged under 65 years there were no significant SIRs.

For women under age 65 significant SIRs were thyroid 10.77, melanoma 4.31 and lung 3.17.

Figure 22.2: Trends in the annual SIR for all second primary cancers



Comments

Few second cancers occurred after multiple myeloma, because of the generally advanced age at diagnosis and the poor survival. Results should be interpreted with caution because of the small numbers.

Other studies have documented increased risks for leukaemia following chemotherapy with

CHRONIC LYMPHOXYTIC LEUKAEMIA

Table 23.1: Characteristics of the cohort

	Males	Females
First primary cancer	1,498	1,083
Age at diagnosis		
Mean	68.2	72
<65 years	532	277
=>65 years	966	806
Total person-years	7,908	5,934
Mean follow-up (years)	5.3	5.5
Histological confirmation (%)	97.8	97.5
Second primary cancers		
Non-simultaneous	293	143
Simultaneous	34	20

Table 23.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	3.8	11.8	18.9	23.5	25.6	25.6
All cancers	F	2.8	8.2	12.7	15.8	17.3	17.3
Colon	M	0.4	0.9	1.3	1.6	1.6	1.6
Colon	F	0.3	1.0	1.3	1.5	1.5	1.5
Rectum	M	0.2	0.4	0.7	0.9	0.9	0.9
Rectum	F	0.2	0.8	1.1	1.4	1.4	1.4
Lung	M	0.8	2.1	3.5	4.0	4.6	4.6
Lung	F	0.3	0.8	1.2	1.5	1.5	1.5
Melanoma	M	0.3	1.1	1.8	2.9	2.9	2.9
Melanoma	F	0.4	0.7	1.3	1.7	2.0	2.0
Prostate	M	0.5	2.3	3.6	5.0	5.3	5.3
Ill defined prim	M	0.2	0.7	1.3	1.6	1.6	1.6
Ill defined prim	F	0.2	1.0	1.2	1.4	1.8	1.8
NHL	M	0.6	1	1.6	1.7	2.2	2.2
NHL	F	0.2	0.8	1.1	1.6	1.9	1.9

All other cancers have 10-year cumulative risk of < 0.5% for both sexes.

alkylating agents. for multiple myeloma

Common second cancers

From Table 23.2 a man's 10-year cumulative risk of contracting a second cancer is seen to be higher than that for a woman (1 in 5 compared with 1 in 8). Common second cancer types include colon, rectum, lung, melanoma, NHL, prostate, other and ill-defined cancers.

Age-specific Incidence

The principal feature of Figure 23.1 is that the age incidence curves for the second primary cancers are much higher at early ages and the curves for both first and second primary cancers rise steeply with increasing age.

Trends in SIRs

The trends in Figure 23.2 show an increased SIR following diagnosis of the first primary with SIRs stable for the first eight years and then increasing with further years of follow-up before falling after twelve years.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 23.4 (page 104) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The statistically significant overall 23-year SIRs are 1.67 for both men and women. There are no SIRs less than 1. Statistically significant SIRs are observed for many types of second cancer - for men for Hodgkin lymphoma 17.43, salivary gland 7.58, NHL 4.08, melanoma 3.13, other 2.94, ill-defined 2.55, lung cancer 2.06 and other cancers 2.94. For women the highest are for oral cavity 5.20, NHL 4.50, melanoma 3.35,

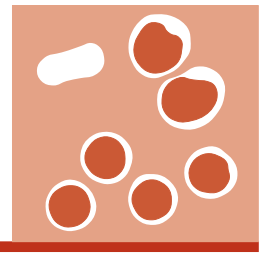


Figure 23.1: Age-specific rates

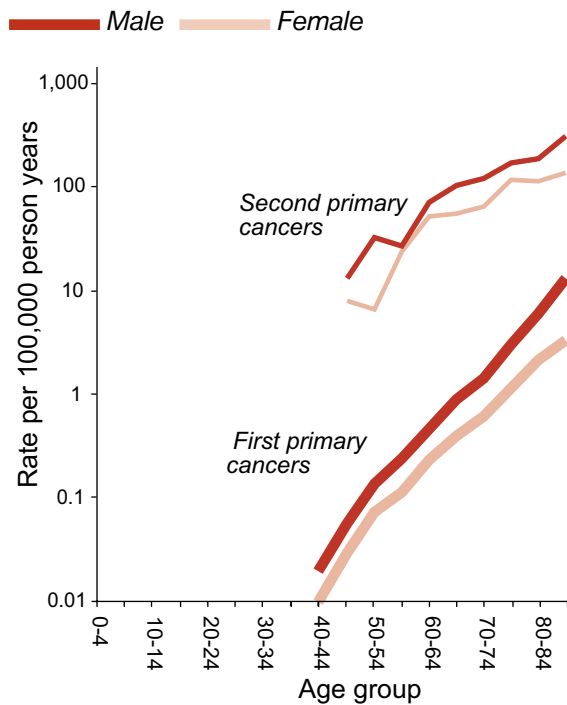
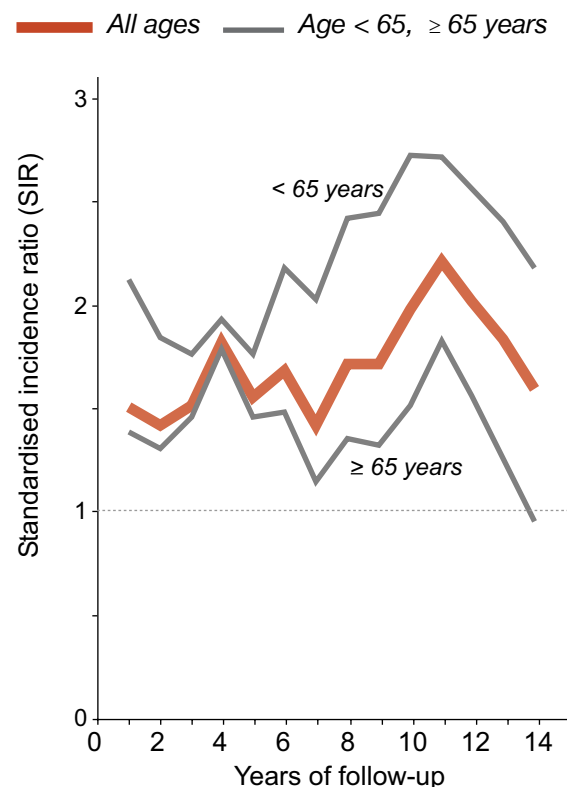


Figure 23.2: Trends in the annual SIR for all second primary cancers



ill-defined 2.75, uterus 2.73, rectum 2.32 and colorectum 1.55.

Trends in SIRs with age

In Figure 23.2 a pattern of increasing SIRs with increasing follow-up is observed for the under 65 year age group which has consistently higher SIRs than the older group at any time during follow-up. Older persons have more stable risks and for both age groups the SIR decreases after 10 years of follow-up.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 23.5 (page 105). The younger age group has a 70% higher risk for men and <10% higher risk for women than the older age group. The SIRs are 2.35 for men first diagnosed before 65 years of age compared with 1.41 for those diagnosed at an older age. The SIRs for women are 1.77 and 1.64 respectively. All the above SIRs are significantly greater than 1.

For the under 65 year age group the highest SIRs for men are Hodgkin lymphoma 27.83, NHL 6.66, other 6.09, melanoma 4.14, lung 2.82 and myeloma 1.67.

For women under age 65 the highest SIRs are ALL 55.55, myeloma 13.28, NHL 11.02 and rectum 4.32.

Comments

Several studies have observed increased risk for cancers of the respiratory tract following chronic lymphocytic leukaemia. The reasons are unclear.

Similarly, the increased risk of melanoma, which has also been reported previously, has no ready explanation. Immune deficiencies are

CHRONIC MYELOID LEUKAEMIA

Table 24.1: Characteristics of the cohort

	Males	Females
First primary cancer	602	472
Age at diagnosis		
Mean	57.5	59.9
<65 years	345	262
=>65 years	257	210
Total person-years	2,376	2,015
Mean follow-up (years)	3.9	4.3
Histological confirmation (%)	97.2	97.5
Second primary cancers		
Non-simultaneous	100	100
Simultaneous	68	45

Table 24.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	3.7	10.3	12.7	14.8	14.8	14.8
All cancers	F	2.6	6.4	9.0	11.1	15.2	15.2
Colon	M	0.0	0.4	0.4	1.2	1.2	1.2
Colon	F	0.2	0.2	0.8	0.8	0.8	0.8
Lung	M	0.5	1.9	2.1	2.1	2.1	2.1
Lung	F	0.0	0.7	1.0	1.0	1.0	1.0
ALL	M	0.3	0.7	1.1	1.7	1.7	1.7
ALL	F	0.2	0.5	0.5	1.0	1.0	1.0
AML	M	1.5	3.7	4.7	4.7	4.7	4.7
AML	F	0.9	2.8	3.9	4.5	6.7	6.7

All other cancers have 10-year cumulative risk of < 0.5% for both sexes.

possible explanations for the increased risk of Hodgkin and non-Hodgkin lymphoma.

Common second cancers

From Table 24.2 a man's 10-year cumulative risk of contracting a second cancer following CML is seen to be higher than that for a woman (1 in 8 compared with 1 in 11). A male excess is seen for three common cancer types, lung, ALL and AML but a female excess only for colon cancer.

Age-specific Incidence

The principal feature of Figure 24.1 is that the age incidence curves for the second primary cancers are much higher at early ages and remain parallel with increasing age.

Trends in SIRs

The trends in Figure 24.2 show an increased SIR following diagnosis of the first primary and that this decreases in the first five years and then increases with further years of follow-up. Small numbers lead to instability in these trends.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 24.4 (page 106) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 2.35 for men and 2.62 for women (both statistically significant). There are no SIRs less than 1 and statistically significant SIRs are observed for men for ALL 200.3, AML 111.2, other 5.23, NHL 3.89

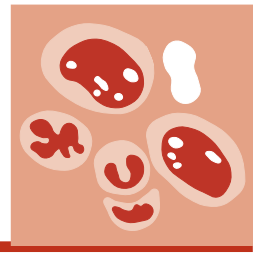


Figure 24.1: Age-specific rates

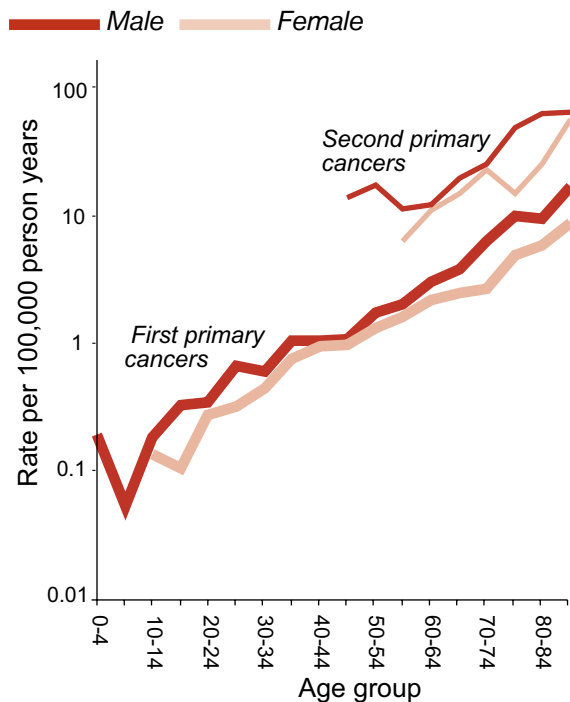
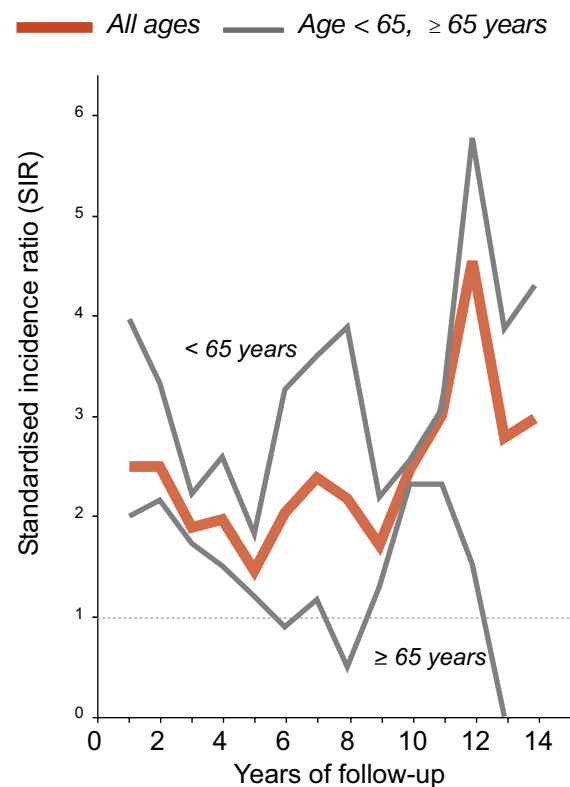


Figure 24.2: Trends in the annual SIR for all second primary cancers



and lung 2.72, and for women for ALL 160.8 and AML 144.8.

Trends in SIRs with age

In Figure 24.2 the general pattern is of decreasing SIRs with increasing follow-up for the first five years is observed for both age groups, with risks for the under 65 year age group increasing thereafter.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 24.5 (page 107). The younger age group has a 60-90% higher SIR than the older age group. The SIRs are 3.54 for men first diagnosed before 65 years of age compared with 1.81 for those diagnosed at an older age. The SIRs for women are 3.40 and 2.07 respectively. All the above SIRs are significantly greater than 1.

For the under 65 year age group statistically significant SIRs for men are ALL 362.6, AML 218.7, NHL 9.95 and other 9.98.

For women under age 65 the statistically significant SIRs are AML 285.1, ALL 100.3, other 14.89, colon 5.29 and colorectum 4.63.

Comments

Several studies have observed increased risk for cancers of the respiratory tract following CML. The reasons are unclear.

The increased risk of ALL and AML is likely to reflect coding conventions with regard to transformation of the original CML. CML may transform into an aggressive acute leukaemia during its blast phase, most commonly AML (around 70%) but also ALL (30%). Cancer registry procedures for coding transformations of haematological malignancies can vary considerably. Because of this variation, reports of second primary cancers for these particular malignancies need to be interpreted with caution, especially when making comparisons with other registry series.