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Return to work following sickness absence due to infectious mononucleosis

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Background Epstein–Barr virus infectious mononucleosis among adults is notorious because of the prolonged incapacitating fatigue it causes.

Aims To investigate the duration of sickness absence and return to work following infectious mononucleosis.

Methods Episodes of sickness absence due to infectious mononucleosis were selected from an occupational health services register. The duration of sickness absence and return to work was assessed with Kaplan–Meier survival analysis.

Results Two thousand one hundred and thirty-seven episodes of absence due to infectious mononucleosis had a median duration of 91 days. Young employees (aged 15–24 years) had the highest return to work rates. Women had longer sickness absence than men. Employees working in small companies were absent longer than employees in large companies.

Conclusions Occupational physicians should advise gradual return to work, starting 4 weeks after the onset of the illness, in order to prevent physical deconditioning and prolonged illness.

Key words Age differences; Epstein–Barr virus; gender differences; infectious mononucleosis; sick leave; sickness absence; return to work.

Introduction

The Epstein–Barr virus is highly prevalent in adults all over the world and spreads through intimate oral contact. In Asia and the developing countries, children are infected in the first years of their life, while primary infection is delayed in most developed countries [1]. In The Netherlands, 50% of children >5 years of age and 90% of adults are reported to have had a subclinical infection [2]. Symptomatic primary Epstein–Barr virus infection is more commonly known as infectious mononucleosis. It is an illness that afflicts adolescents and young adults, as a febrile illness accompanied by pharyngitis and lymphadenopathy [3].

Infectious mononucleosis should be suspected in patients of 10–30 years of age who present with a sore throat and severe fatigue. Mild neutrophil leucocytosis is often present in the first few days, subsequently replaced by characteristic mononuclear T-lymphocytes [4]. Positive antibody titres are found in the serum in >80% of cases after 1 week, and they remain positive for weeks. Infectious mononucleosis is a self-limiting disease, but occasionally, it is complicated by a variety of acute neurologic, haematological, hepatic, splenic, respiratory and/or psychological complications [5,6].

More commonly, adults suffer from a distinct chronic syndrome of fatigue, myalgia and need for sleep, which may persist for several months after the acute infection has resolved. Adults of working age, with clinically manifest infectious mononucleosis, usually report sick because of the incapacitating fatigue, which limits their daily and social activities. These symptoms are usually thought to have a long duration (of months or even a year), confirming the belief that it is necessary to be absent from work for a long time. However, it has been reported that poor physical functioning and less activity during convalescence predict a prolonged state of the illness [7].
Little is known about the sickness absence and return to work of employees with clinically manifest Epstein–Barr virus infectious mononucleosis. Therefore, in this study, we investigated the following:

i) the median duration of sickness absence due to infectious mononucleosis,
ii) sociodemographic differences in the duration of sickness absence due to infectious mononucleosis and
iii) the course of return to work following infectious mononucleosis.

Methods

ArboNed Occupational Health Services registers the sickness absence data of an average of 1 million Dutch employees working in a variety of companies and economic sectors that are representative of the Dutch labour market. In The Netherlands, employees report sick to their employer, who pays sickness benefits. The Dutch sickness absence legislation requires medical certification of sickness by an occupational physician within the first 5 weeks of sickness absence. The occupational physician enquires about the sickness and documents the information in the employee’s medical file, together with a diagnosis based on codes of the International Classification of Diseases (ICD) [8]. Occupational physicians use the ICD-10 code B27 for sickness absence due to serologically verified infectious mononucleosis. We analysed all sickness absence episodes that were diagnosed as infectious mononucleosis between January 2004 and June 2007. Return to work can be partial or full. The period between the first day of sickness absence and return to work to ≥50% of contracted hours was regarded as the time until partial return to work and the period between the first day of sickness absence and return to work to 100% of contracted hours was defined as the time until full return to work.

The age of the employees was registered at the moment they reported sick, and four age groups were used (15–24 years, 25–34 years, 35–44 years and 45–64 years).

Socio-economic status was determined according to the postal code of the employee’s home address. The postal codes were linked to a status score on The Netherlands Institute for Social Research tables, in which all postal codes were linked to a status score on The Netherlands. The age of the men was 30.9 (SD = 9.5) years, and for the women, it was 30.5 (SD = 9.7) years. One hundred and sixty episodes (15%) in the men and 201 episodes (19%) in the women lasted for at least 6 months, and after 1 year, 20 men (2%) and 32 women (3%) were still absent from work. Figure 1 shows that men and women in the age group 15–24 years had a shorter duration of sickness absence duration than employees in the older age groups (logrank test: men \( P < 0.001 \) and women \( P < 0.001 \)).

The duration of sickness absence had a positively skewed distribution. Therefore, the median is preferred as a central measure. The median duration of sickness absence was 91 days (95% CI = 87–95 days) and was shorter for men (median 86 days; 95% CI = 82–90 days) than for women (median 98 days; 95% CI = 92–104 days) \( (P < 0.001) \), as is shown in Table 1.

Table 2 shows the course of sickness absence due to infectious mononucleosis from the start of the episode until the end of the observation period. The median duration until partial or full return to work in those who did return to work was 45 days (95% CI = 42–49 days) and did not differ according to gender: 46 days (95% CI = 42–49 days) for men and 44 days (95% CI = 40–49 days) for women. The mean duration until partial or full return to work was significantly \( (P < 0.05) \) longer for women >45 years than for younger women, while for men, the median time until return to work did not differ significantly between the age groups. Socio-economic status was not associated with the duration until return to work. Employees working in the largest companies returned to work earlier than those working in the smaller companies \( (P < 0.05) \).
Men and women <25 years of age more often recovered without partial return to work compared with employees in the older age groups (logrank test: men $P < 0.001$ and women $P < 0.001$). Employees in the age groups of 25–34 years [hazard rate (HR) = 1.39; 95% CI = 1.21–1.59] and 35–44 years (HR = 1.30; 95% CI = 1.11–1.52) partially returned to work significantly earlier than employees in the age group of 15–24 years but took longer until full return to work (HR = 0.65; 95% CI = 0.59–0.73 and HR = 0.61; 95% CI = 0.53–0.69, respectively), as is shown in Table 3.

For 1906 employees, we were able to count the number of days of sickness absence in the year before sickness absence due to infectious mononucleosis, and we compared this number with the number of days of sickness absence during 12 months after full return to work. The average number of sickness absence days in the previous year was 13.4 (SD = 26.7). This did not differ using the paired $t$-test on the log-transformed number of days of sickness absence 1 year after full return to work (mean = 12.5 days; SD = 29.7 days).

### Table 1. The median duration (95% CI) of sickness absence due to infectious mononucleosis in men and women according to age, socio-economic status and company size

<table>
<thead>
<tr>
<th>Number of sickness absences</th>
<th>Median duration of sickness absence in days (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>15–24</td>
<td>358 (743)</td>
</tr>
<tr>
<td>35–44</td>
<td>255 (450)</td>
</tr>
<tr>
<td>≥45</td>
<td>91 (186)</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>352 (704)</td>
</tr>
<tr>
<td>Medium</td>
<td>352 (707)</td>
</tr>
<tr>
<td>Low</td>
<td>353 (704)</td>
</tr>
<tr>
<td>Company size</td>
<td></td>
</tr>
<tr>
<td>&lt;75 employees</td>
<td>372 (706)</td>
</tr>
<tr>
<td>75–499 employees</td>
<td>275 (545)</td>
</tr>
<tr>
<td>500–4999 employees</td>
<td>293 (642)</td>
</tr>
<tr>
<td>≥5000 employees</td>
<td>121 (230)</td>
</tr>
<tr>
<td>Total</td>
<td>1069 (2137)</td>
</tr>
</tbody>
</table>
The median duration of sickness absence due to infectious mononucleosis was 91 days and was longer for women (98 days) than for men (86 days). The rates of return to work were highest for young employees and for employees working in large companies. It seems likely that in large companies, there are more opportunities to adjust the workload and the work tempo to the level of physical functioning, in consultation with the supervisor and colleagues. The number of sickness absence days in the year before infectious mononucleosis did not differ significantly from the number of days of sickness absence in the year after return to work, suggesting that employees

Table 2. Partial return to work according to gender, age, socio-economic status and company size

<table>
<thead>
<tr>
<th></th>
<th>No or &lt;50% partial return to work, n (%)</th>
<th>Partial return to work, n (%)</th>
<th>Recovered without partial return to work, n (%)</th>
<th>Total, n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men 15–24 years</td>
<td>42 (12)</td>
<td>146 (41)</td>
<td>170 (48)</td>
<td>358</td>
</tr>
<tr>
<td>Men 25–34 years</td>
<td>33 (9)</td>
<td>224 (62)</td>
<td>106 (29)</td>
<td>363</td>
</tr>
<tr>
<td>Men 35–44 years</td>
<td>15 (6)</td>
<td>181 (71)</td>
<td>59 (23)</td>
<td>255</td>
</tr>
<tr>
<td>Men ≥ 45 years</td>
<td>2 (2)</td>
<td>58 (64)</td>
<td>31 (34)</td>
<td>91</td>
</tr>
<tr>
<td>Women 15–24 years</td>
<td>49 (13)</td>
<td>189 (49)</td>
<td>147 (38)</td>
<td>385</td>
</tr>
<tr>
<td>Women 25–34 years</td>
<td>36 (9)</td>
<td>290 (74)</td>
<td>66 (17)</td>
<td>392</td>
</tr>
<tr>
<td>Women 35–44 years</td>
<td>27 (14)</td>
<td>120 (62)</td>
<td>48 (25)</td>
<td>195</td>
</tr>
<tr>
<td>Women ≥ 45 years</td>
<td>3 (3)</td>
<td>59 (62)</td>
<td>33 (35)</td>
<td>95</td>
</tr>
<tr>
<td>Company size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;75 employees</td>
<td>100 (14)</td>
<td>379 (54)</td>
<td>227 (32)</td>
<td>706</td>
</tr>
<tr>
<td>75–499 employees</td>
<td>39 (7)</td>
<td>374 (69)</td>
<td>132 (24)</td>
<td>545</td>
</tr>
<tr>
<td>500–4999 employees</td>
<td>44 (7)</td>
<td>386 (60)</td>
<td>212 (33)</td>
<td>642</td>
</tr>
<tr>
<td>≥5000 employees</td>
<td>22 (10)</td>
<td>123 (54)</td>
<td>85 (37)</td>
<td>230</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>70 (10)</td>
<td>434 (62)</td>
<td>200 (28)</td>
<td>704</td>
</tr>
<tr>
<td>Medium</td>
<td>74 (11)</td>
<td>410 (58)</td>
<td>223 (32)</td>
<td>707</td>
</tr>
<tr>
<td>Low</td>
<td>61 (9)</td>
<td>413 (59)</td>
<td>230 (33)</td>
<td>704</td>
</tr>
<tr>
<td>Total</td>
<td>208 (10)</td>
<td>1268 (59)</td>
<td>661 (31)</td>
<td>2137</td>
</tr>
</tbody>
</table>

*Partial return to work = return to work to ≥50% of contracted hours.

Table 3. Cox regression of duration until partial and full return to work

<table>
<thead>
<tr>
<th></th>
<th>Partial return to work</th>
<th>Full return to work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (95% CI)</td>
<td>HR (95% CI)</td>
</tr>
<tr>
<td>Men (reference)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Women</td>
<td>1.04 (0.93–1.16)</td>
<td>0.81 (0.74–0.89)**</td>
</tr>
<tr>
<td>Age 15–24 years (reference)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>25–34 years</td>
<td>1.39 (1.21–1.59)**</td>
<td>0.65 (0.59–0.73)**</td>
</tr>
<tr>
<td>35–44 years</td>
<td>1.30 (1.11–1.52)**</td>
<td>0.61 (0.53–0.69)**</td>
</tr>
<tr>
<td>≥45 years</td>
<td>1.12 (0.90–1.39)</td>
<td>0.68 (0.58–0.81)**</td>
</tr>
<tr>
<td>Company size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;75 employees</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>75–499 employees</td>
<td>1.45 (1.25–1.67)**</td>
<td>1.18 (1.04–1.33)**</td>
</tr>
<tr>
<td>500–4999 employees</td>
<td>1.29 (1.12–1.49)**</td>
<td>1.20 (1.07–1.34)**</td>
</tr>
<tr>
<td>≥5000 employees</td>
<td>1.31 (1.07–1.61)**</td>
<td>1.51 (1.28–1.77)**</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.02 (0.89–1.17)</td>
<td>1.01 (0.91–1.13)</td>
</tr>
<tr>
<td>Medium</td>
<td>0.91 (0.79–1.04)</td>
<td>0.92 (0.82–1.03)</td>
</tr>
<tr>
<td>Low (reference)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

The table shows HR and their 95% CI. A HR > 1 indicates a shorter duration until (partial) return to work, whereas a HR < 1 reflects a longer duration; *P < 0.05 and **P < 0.01.

*Partial return to work = return to work to ≥50% of contracted hours.

Discussion

The median duration of sickness absence due to infectious mononucleosis was 91 days and was longer for women (98 days) than for men (86 days). The rates of return to work were highest for young employees and for employees working in large companies. It seems likely that in large companies, there are more opportunities to adjust the workload and the work tempo to the level of physical functioning, in consultation with the supervisor and colleagues. The number of sickness absence days in the year before infectious mononucleosis did not differ significantly from the number of days of sickness absence in the year after return to work, suggesting that employees
return to normal working capacity after full return to
work.

For this study, we selected sickness absence episodes
certified as infectious mononucleosis by an occupational
physician. The diagnostic codes documented by the occu-
pational physicians were based on serologically verified in-
fectious mononucleosis, implying that the diagnoses had
a high specificity. This may have over-estimated the dura-
tion of sickness absence because patients with mild-to-
moderate malaise and fever may remain unrecognized
in primary care or they sometimes continue to work de-
spite their moderate illness. We had no knowledge about
comorbidity or whether complications occurred over time.
Psychiatric disorders, and especially mood disorders, are
prevalent in patients suffering infectious mononucleosis,
particularly in the first 6 months of the illness [10,11].

Epstein–Barr virus infectious mononucleosis has a dif-
terent course in adults than in adolescents. Adults mainly
suffer from a fever, often with liver abnormalities [12],
and delayed convalescence is not uncommon. Buchwald
et al. [13] reported that 12% of adults failed to recover 6
months after acute glandular fever. White et al. [10]
reported that 40% of patients with infectious mononu-
cleosis were still severely fatigued after 6 months and 22%
suffered hypersomnia. Our results showed that ~50%
of the employees returned to work 3 months after the di-
agnosis and 80% returned to work after 6 months. Sickness
absence lasted for >1 year in 2–3% of the adults. Lambore
et al. [14] found that 6% of adults with chronic
symptoms of infectious mononucleosis reported that their
tiredness and daytime sleepiness persisted for >1 year.

Earlier research has shown that rest is the most com-
mon advice given by general practitioners to patients with
infectious mononucleosis [15]. However, poor physical
functioning plays a key role in causing prolonged symp-
toms following acute infectious mononucleosis. Candy
et al. [7] reported that restriction of activities in the acute
phase is associated with a poorer outcome, in terms of
longer work incapacity. In the literature, gradual return
to competition is recommended for sportsmen with no
spleen enlargement 4 weeks after the onset of illness
[16,17]. In occupational medicine practice, abdominal
ultrasound scanning is often not available to demonstrate
hepatomegaly or splenomegaly; however, these complica-
tions mostly appear in the first 4 weeks of illness [16].
Therefore, it should be feasible for employees to gradually
return to work 4 weeks after the onset of sickness absence
due to infectious mononucleosis. However, our results
show that return to work takes almost twice as long be-
cause the median duration until partial or full return to
work was 45 days (95% CI = 42–49 days) for those
who did return to work.

The World Health Organization International Classi-
fication of Functioning, Disability, and Health explains
how disease and disability are related [18]. Diseases or
disorders affect body structure and function, impair activ-
ities and restrict participation. Whether or not this leads
to disability depends on conditional factors of environ-
mental origin (such as workload) and of personal origin
(such as personal ideas about the illness). In assisting a pa-
tient to recover from infectious mononucleosis, the occu-
pational physician has three opportunities to stimulate
return to work. The first opportunity is to include daily
activities and return to work in the treatment, instead
of advising rest. Second, special arrangements, such as
gradual return to work, reduced workload or modified
work, may facilitate the return to work of employees. Sup-
port from close relatives, attending physicians and col-
leagues and a supportive work environment contribute
to the self-confidence of employees in returning to work.
Third, attention must be paid to changing disability cog-
itions, particularly unreal beliefs and views about pro-
longed disability following infectious mononucleosis. It
has recently been reported that patients with infectious
mononucleosis who were advised to pursue activities in
a psycho-educational intervention recovered faster than
patients with restricted activity [15].

We conclude that in our study population, the duration
until return to work following infectious mononucleosis
exceeded the recommendations and the duration
reported in a population of sportsmen [16,17]. General
practitioners and occupational physicians should avoid
advising rest, in order to prevent prolonged fatigue and
failure to recover. If there are no complications, it is safe
to start gradual return to work 4 weeks after the onset of
infectious mononucleosis.

Key points

- Little is known about the sickness absence and re-
turn to work of employees with Epstein–Barr virus
infectious mononucleosis.
- Sickness absence due to infectious mononucleosis
has a median duration of 91 days, whereas the
acute phase of mononucleosis lasts for ~4 weeks.
- General practitioners and occupational physicians
should avoid advising rest, in order to prevent
physical deconditioning.

Conflicts of interest

None declared.

References

of Epstein–Barr virus in Japan: trends and future prediction.